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universities and special schools**

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Iowa State University
University of Northern Iowa
Iowa School for the Deaf
Iowa Braille and Sight Saving School
Lakeside Lab Regents Resource Center
Quad-Cities Graduate Center
Southwest Iowa Regents Resource Center
Tri-State Graduate Center



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January 12, 2012

Michael E. Marshall
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Des Moines IA 50319

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Chief Clerk of the House
State Capitol Building
Des Moines IA 50319

Holly Lyons, Division Director
Legislative Services Agency
State Capitol Building
Des Moines IA 50319

Re: Economic Development and Technology Transfer Report

Dear Members of the Iowa General Assembly:

Pursuant to Iowa Code and 2011 Iowa Acts, the enclosed annual report includes information from the University of Iowa, Iowa State University, the University of Northern Iowa, and their respective research foundations as follows:

Iowa Code §262B.3(3)

Iowa Code §15G.111(5.c)

2011 Iowa Acts, Chapter 130 §14

Patents and Licenses

Grow Iowa Values Fund

Progress of Regents Institutions on Technology
Transfer and Economic Development

If there are any questions concerning this report, please do not hesitate to contact us.

Sincerely,

Robert Donley

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Enclosures
cc: Legislative Liaisons
Legislative Log

Contact: Keith Saunders

2011 ECONOMIC DEVELOPMENT AND TECHNOLOGY TRANSFER REPORT

Actions Requested: Consider recommending the following to the Board:

- 1) Receive the report.
- 2) Direct that this report and copies of complete institutional reports be forwarded to the Secretary of Senate, the Chief Clerk of the House of Representatives, the Legislative Services Agency, and the Office of the Governor and the Director of the Iowa Department of Economic Development pursuant to Iowa Code Chapters 262B.3, HF 809 (2005 Session) and HF 2459 (2006 Session).

Executive Summary:

The Regents universities promote the economy of Iowa most notably by providing higher education to the people of the state. The universities also make a significant contribution to the Iowa economy by conducting academic research that results in intellectual property and applications available to the marketplace and by providing expertise and assistance directly to Iowa's people, industry and communities. The University of Iowa (SUI), Iowa State University (ISU) and the University of Northern Iowa (UNI) thus support the economy of Iowa primarily through their core missions, and their economic contributions to the state are fundamentally linked to their overall academic excellence.

This core mission was supported by \$841.8 million in funding sponsored by federal and corporate sources in FY 2011. This funding provided the basis on which the Regents universities conducted a wide variety of economic development programs that produced the following results in the past year:

- 182 new intellectual property disclosures
- 169 patent applications
- 75 new patents awarded
- 75 new license and option agreements on intellectual property
- 322 total license and option agreements yielding income
- \$18.6 million in royalty and fee income
- \$90.4 million in revenue generated by Iowa companies as a direct result of university technologies
- 2,509 Iowans employed at 121 companies at the SUI, ISU and UNI research parks and incubators

State funding of ongoing economic development programs at the universities has declined by 58% comparing FY 2001 to FY 2011. Grow Iowa Values Fund appropriations to the universities in FY 2011 were reduced to \$3.8 million are 24% lower than the original FY 2005 authorization.

Selected FY 2011 Economic Development and Technology Transfer Highlights

University of Iowa:

- The UIRF executed 8 option and license agreements to startups based on UI intellectual property, and assisted in forming 3 new startup companies based upon UI Intellectual Property. At year-end, 20 UI initiated startup companies remained viable with 14 of these residing in Iowa. In FY11 the funding and financing of these startups (\$33M) doubled over the FY10 total (\$16M), which had doubled over the FY09 total (\$7M). Eleven startups were successful in securing funding and financing, and numerous startups that received funding in FY10 continued to secure additional funding in this year.

- The Iowa Medical Innovation Group (IMIG) is a rapidly growing student oriented interdisciplinary program involving students from the Colleges of Medicine, Engineering, Business and Law focused on the identification of solutions to clinical problems and focused in Health IT and medical devices. Under the auspices of JPEC and UIRF, senior faculty mentor interdisciplinary student innovation teams. In FY 11 two viable technologies emerged for further development.
- The UI Research Park companies and affiliated labs report 1618 employees living in 161 communities in 45 Iowa counties, a regional labor shed covering almost one-half of the state. The average individual salary of \$63,000, which translates into an annual payroll of nearly \$100 million, results in an estimated \$9.0 million in state income taxes in 2011.
- The BioVentures Center currently has 9 tenants, 6 of which are spun from UI technology, for an occupancy rate of 65%. The Technology Innovation Center (TIC) currently houses 11 tenant companies for an occupancy rate of 77% with two new tenants (Angel eCare and Brain Image Analysis) this year. Since TIC opened in 1989, 23 of the 41 companies affiliated with TIC are still in business in Iowa today.

Iowa State University:

- The ISU Research Park continues to be successful in initiating as well as nurturing numerous new businesses. Nine new companies and affiliates joined the Park in FY11, bringing the historical total to 210 companies, research centers, and affiliates. Currently, there are 53 companies, research centers, and affiliates located in the Park, employing 839 people.
- Companies receiving technical assistance from ISU's Institute for Physical Research and Technology reported that the estimated impact of projects conducted in the last year was \$16.9 million; the average impact over the last 5 years is \$12.8 million per year. Companies also estimated over 24 jobs were created or retained each year from 2005-2010 with 20 jobs retained or created from projects surveyed in the past year.
- In FY11, 1,235 businesses from 95 counties in the state received assistance on projects or attended educational workshops from ISU's Center for Industrial Research and Service staff or partners. Companies responding to surveys reported \$43 million in new investments, \$19 million in costs saved or avoided, and \$331 million in sales gained or retained. Company executives stated that 6,037 jobs were added or retained as a result of the assistance they received from CIRAS and partners.
- The Small Business Development Center (SBDC) provided business assistance to companies, involving 2,786 clients and 11,641 counseling hours. They also conducted 351 training workshops in which 4,017 individuals participated.

University of Northern Iowa:

- UNI provided service in all 99 counties of Iowa to nearly 1,300 unique businesses, community and local government clients; another 100,000 individuals were engaged in the MyEntre.Net entrepreneurial support system.
- UNI involved 212 faculty members and more than 2,000 students in the delivery of its services to Iowa businesses and communities.
- UNI's three incubator/accelerators programs and MyEntre.Net helped start or expand 247 business ventures creating 175 FTE jobs.

- 21 student businesses were tenants in the John Pappajohn Entrepreneurial Center's Student Business Incubator and 43 additional student entrepreneurs were assisted by the affiliate program.

Engagement

Many organizational units at the Regents universities are engaged with Iowa's people, industry and communities for the promotion of the state's economic development. Key economic development efforts include: research, intellectual property development and technology transfer, business incubation and acceleration, direct technical assistance to local and regional economic development groups, technical assistance and counseling to businesses, market research for Iowa companies and attracting and retaining businesses in the state. These activities are also highly coordinated with the economic development efforts of the Governor, the Iowa General Assembly and state agencies including the Iowa Department of Economic Development.

State Funding for Economic Development and Technology Transfer

State funding in FY2011 was provided in two primary economic development program areas:

1. Ongoing Economic Development and Technology Transfer Programs: FY 2011 \$3.41 million

In FY 2011, the state provided \$3.41 million for several ongoing programs which include the research parks at SUI and ISU, the Institute for Physical Research and Technology, the Small Business Development Centers, the Institute for Decision Making, the Metal Casting Center and the Center for Advanced Drug Development. For FY 2012, state support for these programs declined again by an additional 5.9 percent. Total state support for these programs now stands at \$3.21 million for FY 2012. This is a decline of 58% below the \$7.63 million provided in FY 2001.

2. Grow Iowa Values Fund (GIVF): FY 2011 \$3.8 million

In FY 2005, the General Assembly authorized a ten-year annual appropriation of \$5 million under the GIVF to the Regents universities for purposes of supporting the human and physical infrastructure needed to effectively develop and transfer technology discoveries and to fund development projects involving existing companies and start ups.

Many of the GIVF-funded projects involve multi-year research and development efforts with private companies. A number of projects funded in earlier years are now being completed and are demonstrating a significant impact on job and wealth creation.

For FY 2011 the General Assembly approved \$3.8 million in GIVF funding, of which \$3.65 million was allocated for the three universities and \$152,000 was allocated for projects submitted by Iowa's independent colleges and universities. The FY 2012 GIVF appropriation was reduced again to \$1.5 million. The Board of Regents approved the universities' FY 2012 proposals at the September 2011 Board meeting. The universities and companies involved in GIVF projects have identified matching funds for the projects. Examples of projects included:

- Terpenoid Therapeutics was provided GIVF funding proof of concept funding in 2005 by the University of Iowa. The company is currently located in the University of Iowa Research Park in the BioVentures Center Incubator and currently has 6 employees. Terpenoid Therapeutics, Inc. is a spin off cancer drug discovery and development company based on the intellectual property from the research of Drs. David Wiemer and Raymond Hohl in Chemistry and Oncology, respectively. The company has been successful in multiple Small Business Innovation Research grant applications, the Iowa Department of Economic Development DEMO fund as well as in raising significant private capital and has two lead compounds approaching Phase I human clinical

trials. Since 2005, the company has raised over \$2M in external funds including IDED demonstration funds (\$150K), Series A funding (\$1.5M) and SBIR/STTR (\$414K).

- Iowa State professor, Dr. Brehm-Stecher, is collaborating with Advanced Analytical Technologies, Inc. to develop a faster method to detect and genetically identify salmonella from contaminated foods. The new method would replace the current system of salmonella detection with a new approach that can provide DNA sequencing-like results in hours rather than days. Faster detection of specific strains can mean recognizing an outbreak sooner and stopping tainted food from being delivered and consumed. Brehm-Stecher's collaborator, Advanced Analytical Technologies, Inc., from Ames, is providing advanced biomedical instruments and reagents for the research.
- The Tallgrass Prairie Center (TPC) at UNI continues a relationship with Cedar Falls Utilities (CFU) to determine the maximum energy production potential from prairie biomass. CFU will burn the biomass in their stoker furnace to evaluate the materials. Unfortunately, the June 2008 flood has set the project back one year. Plots were replanted in 2009 and second year biomass data will be collected this fall. Test burn of biomass will be conducted in spring 2012. TPC continues working with the Iowa Crop Improvement Association to develop a consortium of native seed producers, native plant growers, nurseries, Iowa Department of Natural Resources, Iowa Department of Transportation, Iowa Natural Resources Conservation Service and private individuals to market native plants.

Private College Grant Program

Of the \$3.8 million in FY 2011 GIVF funding, \$152,000 was awarded by the Board of Regents at the February 2010 meeting to three independent universities and colleges for economic development and technology transfer projects.

- Luther College received funding for research into the use of cyclodextrins as a new and potentially less expensive method of detecting furans, dioxanes and polychlorinated biphenyls which can pollute water systems. The researcher believes a low-cost, effective detection method could be commercialized and, once proven, could be expanded to detect other forms of chemical pollutants. The research indicates that the results of the project will be shared with environmental regulatory agencies.
- Clarke College received funding to continue work previously done under GIVF funding that created a web-based analysis library and software tool/portal for clinicians and medical researchers gathering HIV data. The project is a collaboration among faculty at Clarke, UIHC, the University of Wisconsin Hospitals and Clinics, Stanford University School of Medicine and physicians at Dubuque Internal Medicine. The additional funding will allow Clarke to use the software, hardware and research tools developed to design and implement an Iowa clinical ontology in collaboration with a Dubuque clinician. The ontology will enable patients and clinicians to obtain statistical analysis related to patient health conditions by taking advantage of electronic medical records. The researchers believe the proposal will enhance the development of health informatics services in Iowa and plan to license the software product. The researchers propose to work with the Small Business Administration to develop a strategy promoting a medical informatics center in Iowa.
- Upper Iowa University received funding to accelerate a business development program funded in part by the University's Upper Iowa Business Development (UIBD) grant program. The UIBD is a \$570,000 endowment created in 2007. The program supports economic development initiatives including a grant program for entrepreneurs interested in starting or expanding a business in Fayette, Iowa. Local business applicants are evaluated based on their business

plan, growth potential, impact on job creation, and sales and taxes generated. Applicants are provided business development assistance and entrepreneurship mentoring through the University's e-Center and are advised about other sources of funding or tax credits. Funding provided the applicants may be used for research and development or commercialization of a product, marketing or advertising or construction and renovation expenses. Applicants are evaluated by a UIBD Grant Advisory Committee which includes representatives of local and regional economic development organizations. Applicants are required to provide a minimum of 20% cash match.

The Board will review FY 2012 proposals from private colleges at the December 2011 meeting. A total of \$60,000 will be available for these projects.

Full Reports Available

The full annual reports from the universities are available at the Board of Regents website and will be provided to the General Assembly, the Governor's Office, the Legislative Services Agency and the Iowa Department of Economic Development.

Table 1: Intellectual Property, Technology Transfer, and External Support FY2009-2011

Indicators	FY 2009				FY 2010				FY 2011			
	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals
1. Number of disclosures of intellectual property	95	70	12	177	111	70	8	189	106	68	8	182
2. Number of patent applications filed	40	128	6	174	26	107	8	141	47	90	5	169
3. Number of patents awarded	23	116	4	143	29	97	3	129	25	43	3	75
4. Number of license and option agreements executed on institutional intellectual property in total	84	18	3	95	97	21	3	121	49	24	2	75
5. Number of license and option agreements executed on institutional intellectual property in Iowa	32	2	3	37	32	6	2	41	19	5	1	25
6. Number of license and option agreements yielding income	121	135	13	269	260	129	11	400	217	94	11	322
7. Revenue to Iowa companies as a result of licensed technology ¹	\$103 million	\$1.71 million	\$3.2 million	\$107.9 million	\$58 million	\$2.03 million	\$2.7 million	\$62.7 million	\$86 million	\$1.99 million	\$2.4 million	\$90.4 million
8. Number of startup companies formed, in total (through licensing activities)	1	2		3		3		3*	2	3		5
9. Number of startup companies formed, in Iowa (through licensing activities)	1	2		3		3		3*	2	3		5
10. Number of start up companies formed through UNI MyEntrene/IIncubator			74	74			72	72*			61	61
11. Number of companies in research park/ incubators	62	50	34	146	59	46	30	135	57	41	23	121

*corrected

numbers

Indicators	FY 2009				FY 2010				FY 2011			
	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals	ISU	SUI	UNI	Regents Totals
12. Number of new companies in research parks and incubators	16	6	23	45	11	3	11	25	10	2	15	27
13. Number of employees in companies in research parks and incubators	854	2029	65	2948	758	2010	61	2829	846	1618	45	2509
14. Royalties and license fee income	\$9.3 million	\$42.9 million	\$117,000	\$52.3 million	\$9.4 million	\$27 million	\$118,849	\$36.52 million	\$11.3 million	\$6.28 million	\$99,074	\$18.57 million
15. Total sponsored funding (\$ million)	\$305.2 million	\$429.5 million	\$39.7 million	\$774.4 million	\$388.2 million	\$466.5 million	\$42 million	\$896.7 million	\$342.3 million	\$456.5 million	\$43 million	\$841.8 million
16. Corporate-sponsored funding for research and economic development ² in total (\$ million)	\$22.4 million	\$38.6 million	\$1.35 million	\$62.35 million	\$21.1 million	\$30.8 million	\$1.55 million	\$53.45 million	\$24.9 million	\$44.7 million	\$2.07 million	\$71.7 million
17. Corporate-sponsored funding for research and economic development ² in Iowa (\$ million)	\$12 million	\$1.5 million	\$1.35 million	\$14.85 million	\$11 million	\$1.8 million	\$1.55 million	\$14.35 million	\$12 million	\$1.5 million	\$2.07 million	\$15.6 million

¹Aggregate sales reported by Iowa companies of products and services based on licensed inventions.

²Excludes corporate philanthropy

**The University of Iowa
2011 Annual Economic Development Report**

EXECUTIVE SUMMARY

Research drives innovation at The University of Iowa. In FY11, The University of Iowa generated impressive extramural support of \$456.5 million. This outstanding productivity continues to place the UI among the nation's elite public research universities and is especially significant in the face of challenging economic conditions in Iowa. This robust research enterprise and integrated economic development activities at the UI have a significant and far reaching impact on the state of Iowa's economy. The IOWA Centers for Enterprise (ICE) provides infrastructure and services to enhance technology transfer and commercialization of UI technologies, new company formation, support of Iowa companies and workforce development. ICE currently includes the following departments.

- The University of Iowa Research Park (formerly Oakdale Research Park) (UIRP)
- The University of Iowa Research Foundation (UIRF)
- The John Pappajohn Entrepreneurial Center (JPEC)
- BioVentures Center (BVC) and The Technology Innovation Center (TIC)
- The University of Iowa Small Business Development Center (SBDC)

In September 2010, the UI released its Economic Impact Study that highlighted and emphasized the impact of research and economic development programs on the state of Iowa. The report is available at <http://www.uiowa.edu/impact/> and reiterates both the opportunities and challenges related to successfully translating basic research funded by the federal government to viable economic impact locally.

The impact of research often is not shown in the economy until years after its initiation. Based upon current research funding of \$429.5 (FY09) million, the economic impact of spin-off businesses and commercialization of research in existing companies is estimated to be between \$1.4 billion (conservative) and \$2.4 billion (aggressive) on the state's economy by 2020.

FY11 proved to be an outstanding year for economic development activities at the University of Iowa. Our most notable accomplishments include:

- The UIRF executed 8 option and license agreements to startups based on UI intellectual property, and assisted in forming 3 new startup companies based upon UI Intellectual Property. At year-end, 20 UI initiated startup companies remained viable with 14 of these residing in Iowa. In FY11 the funding and financing of these startups (\$33M) doubled over the FY10 total (\$16M), which had doubled over the FY09 total (\$7M). Eleven startups were successful in securing funding and financing, and numerous startups that received funding in FY10 continued to secure additional funding in this year
- The Iowa Medical Innovation Group (IMIG) is a rapidly growing student oriented interdisciplinary program involving students from the Colleges of Medicine, Engineering, Business and Law focused on the identification of solutions to clinical problems and focused in Health IT and medical devices. Under the auspices of JPEC and UIRF, senior faculty mentor interdisciplinary student innovation teams. In FY 11 two viable technologies emerged for further development. In the current academic year, 20 technologies were initially explored and 4 of these are moving forward.
- The UI Research Park companies and affiliated labs report 1618 employees living in 161 communities in 45 Iowa counties, a regional labor shed covering almost one-half of the state. Average individual salary of \$63,000 which translates into an annual payroll of nearly \$100 million, resulting in an estimated \$9.0 million in state income taxes in 2011. The BioVentures Center currently has 9 tenants, 6 of which are spun from UI technology, for an

occupancy rate of 65%. The Technology Innovation Center (TIC) currently houses 11 tenant companies for an occupancy rate of 77% with two new tenants (Angel eCare and Brain Image Analysis) this year. Since TIC opened in 1989, 23 of the 41 companies affiliated with TIC are still in business in Iowa today.

- The University of Iowa's John Pappajohn Entrepreneurial Center (JPEC) offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development in FY211 include: providing business consulting services to small companies located across Iowa through its student field study program (55 companies assisted); hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation (5 competitions held); supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory (17 offices at full capacity, plus 8 businesses on a waitlist); and delivering entrepreneurial education through academic courses across campus and online (103 sections taught on campus and 33 sections taught online), workshops/seminars (24 workshops held), and high school teacher training and curriculum.
- In FY11, the Small Business Development Center served 306 clients, assisted in 30 business startups, helped clients raise over \$3,800,000 in financing and created 103 jobs.
- In September, voters passed bond referendum that will enable the construction of a unique STEM education innovation center which will serve high school students from 7 surrounding school districts through joint UI, Kirkwood and Local High School faculty.

The following sections of this report will directly respond to specific areas as requested by the Board of Regents. These include: the impact of the University of Iowa activities on the economic growth in Iowa, institutional activities and services that indirectly promote economic development, quantitative information regarding economic development activities in FY11, a summary of outreach and service activities, direct economic development assistance to Iowa communities, summary of GIVF expenditures, and emerging trends in the area of economic development.

IMPACT OF ULECONOMIC DEVELOPMENT ACTIVITIES ON THE ECONOMIC GROWTH IN IOWA

Job creation and wealth in Iowa

University of Iowa Research Park (UIRP)

UIRP, formerly known as the Oakdale Research Park & Oakdale Research Campus, is a blended campus consisting of a multitude of commercial ventures and a variety of university academic programs and infrastructure assets. As of June 2011, 8 established companies, 20 startup companies and 6 University anchor laboratories were located in the park. These companies have access to University research infrastructure including internet access and access to libraries and research facilities, core facilities to support chemistry, biology, computation and instrumentation. Importantly, companies have access to faculty collaborators and to students as interns or employees.

In FY 2011 the 41 active Iowa companies affiliated with UI Research Park and Technology Innovation Center¹ reported 1,618 employees earning an average salary of \$63,000. The 1,618 employees of companies and laboratories affiliated with the UI Research Park and business incubator reported living in 161 communities in 45 Iowa counties, a regional labor shed covering almost one-half of the state. The annual payroll nears \$100 million resulting in an estimated \$9.0 million in state income taxes in 2011. The affiliated companies and laboratories also reported employing 34 UI students, and 50 employees had earned doctoral degrees.

BioVentures Center (BVC)

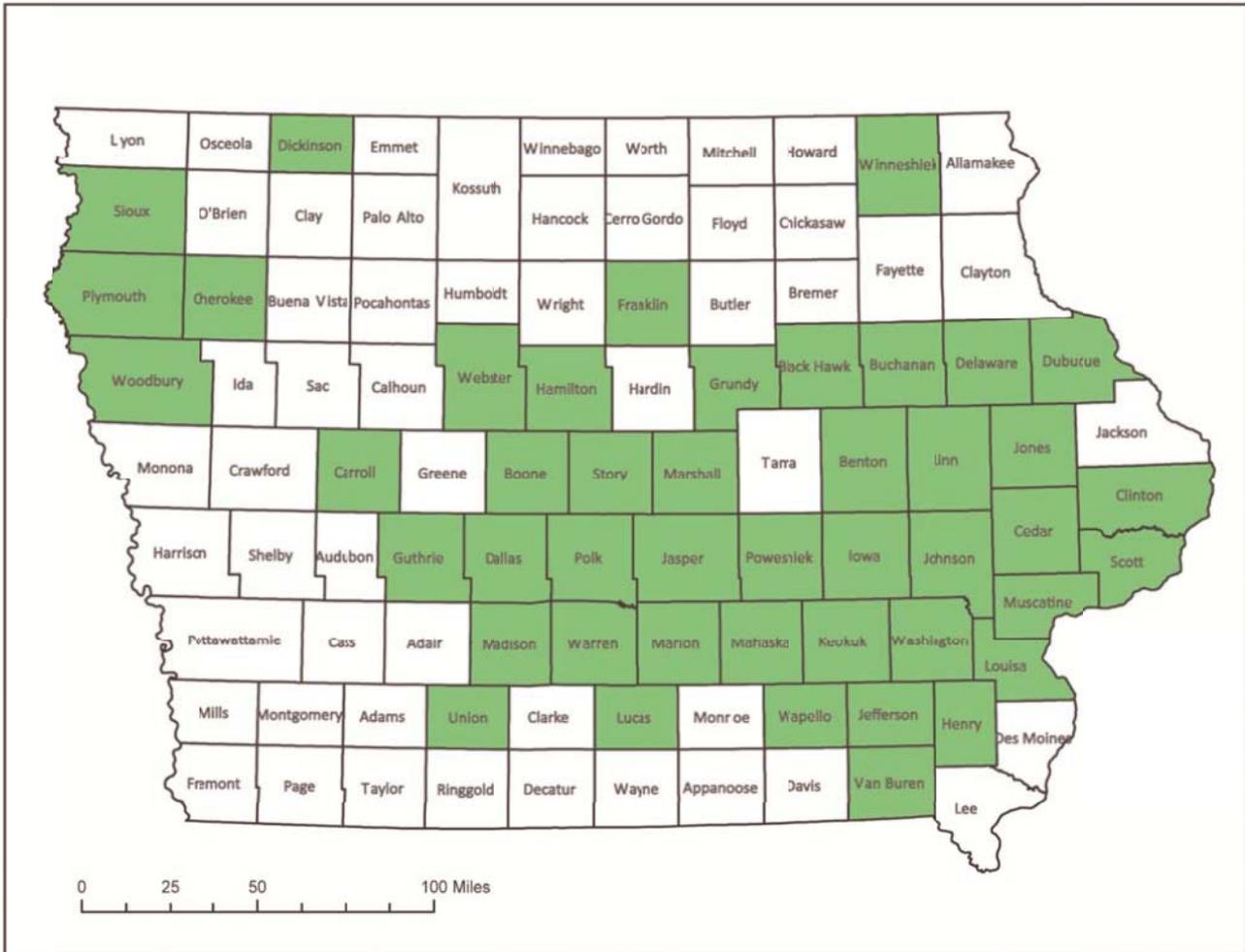
The UI BioVentures Center at the Research Park opened in November of 2008. This 35,000 sq. ft. state-of-the-art biosciences incubator facility allows the University to provide laboratory facilities to support technology based companies emerging from the commercialization of faculty research as well as other startup companies drawn to the area by the substantial R&D assets of the University. We have 7 resident companies and have leased 10 of the 20 laboratories in this facility to startup companies, 6 of which were formed from technology created by UI faculty. GIVF funding was critical in enabling the design and construction of this facility, which now allows us to capitalize on University assets. Nine companies (ASL Analytical, Bio::Neos, Inc., Cellular Engineering Technologies, CQM Systems, Exemplar Genetics, KemPharm, Inc., Terpenoid Therapeutics, Inc, Vertex Pharmaceuticals, VIDA Diagnostics) occupy 10 laboratories and 19 offices in BVC, accounting for 65% of leasable space. Two floors of the west wing of the BioVentures Center have been fit out for those UI units previously housed in Oakdale Hall. These units are associated with research centers reporting to the Colleges of Public Health, Pharmacy and Office of The Vice President for Research.

Technology Innovation Center (TIC)

The Technology Innovation Center provides office space and a nurturing business environment to new technology-based ventures that do not require wet laboratories. In FY11, TIC reported two new tenants (Angel eCare and Brain Image Analysis), for a total of 11 companies. The occupancy rate for the TIC is at about 77%, 27 of the 35 offices are currently rented. Since TIC opened in 1989, 23 of the 41 companies affiliated with TIC are still in business in Iowa today.

¹ This includes active companies at the Technology Innovation Center and/or at the UI Research Park, and graduate companies located in Iowa that are still in business.

**FY11 Labor Shed for Affiliated Companies and Anchor Laboratories
UI Research Park, BioVentures Center and Technology Innovation Center**



Institutional activities and services which indirectly promote economic development

University of Iowa Research Park, BioVentures Center and Technology Innovation Center

A variety of educational and training programs are offered for UIRP/BVC/TIC tenants and faculty investigators including company marketing techniques, SBIR grant writing workshops, and other entrepreneurial workshops and boot camps. Quarterly round ables are held at the BioVentures Center. These roundtables are initiated by the Research Park companies. Agenda items cover Park and BVC updates as well as company issues and concerns. The Multi-Purpose Room at the BioVentures Center was also made available in FY 2011 to over 50 outside groups.

The John Pappajohn Entrepreneurial Center (JPEC)

JPEC offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development include: providing business consulting services to small companies located across Iowa through its student field study program (55 companies assisted last year); hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation (5 competitions held); supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory (17 offices at full capacity, plus 8 businesses on a waitlist); and delivering entrepreneurial education through academic courses across campus and online, workshops/seminars, and high school teacher training/curriculum.

- ✓ JPEC is one of the nation's top undergraduate entrepreneurship programs. The Center combines academic course work with experiential learning and is open to all UI students. Each year, over 2,000 students enroll in entrepreneurship courses and, since the program launched in 1997, over 1,800 students earned one of the certificates offered by the Center.
- ✓ The Bedell Entrepreneurship Learning Laboratory has been operating over its capacity of 17 offices, housing a total of 24 businesses throughout the past year. A total of 211 students from nearly every College have been impacted by the facility and received assistance on their business plans since its inception in 2004.
- ✓ The Jacobson Institute for Youth Entrepreneurship is a comprehensive program that enriches K-12 students' lives through classroom and practical educational experiences. During FY2011, the Jacobson Institute impacted over 800 youth and worked with nearly 350 teachers including 29 newly trained high school teachers in Iowa who are using the YouthBiz Central online curriculum. 116 students participated in summer camps held across Iowa.

IOWA Centers senior staff participated in economic development organizations in FY11.

STATEWIDE:

- Iowa Department of Economic Development (IDED)
 - Board, Bioscience Alliance of Iowa (BAI)
 - Board, Iowa Information Technology Council (ITC)
- Iowa Biotechnology Association, Board of Directors
- Technology Association of Iowa, Board of Directors
- Technology Association of Iowa, Panelist Reviewer for TAI annual awards
- Prolog Ventures, Iowa Deal Flow Committee
- Iowa Venture Capital and Entrepreneur Conference, Planning Committee
- Iowa First Capital Fund, Advisory Board
- Entrepreneurial Development Center Board, Member

LOCAL AND REGIONAL:

- Priority One, Board of Directors
- Corridor Business Alliance
- Iowa City Area Development Group, Board of Directors
- Iowa City Area Chamber of Commerce, Member
- Dubuque Sustainable City initiatives

NATIONAL:

- AUTM- Association for University Technology Managers Board of Directors, Assistant VP of Finance
- AUTM Foundation Board of Directors, Member
- National Science Foundation (NSF) SBIR program, Mentor for Phase I-II awarded startups

- NSF SBIR program, Panelist for Proposal Reviews
- NBIA National Business Incubator Association
- AURP Association of University Research Park and Association of University Midwest Research Park Directors
- COGR – Council on Governmental Relations

METRICS DESCRIBING ULECONOMIC DEVELOPMENT ACTIVITY FY11

a. Number of disclosures of intellectual property	68
b. Number of patent applications filed <ul style="list-style-type: none"> • U.S. Applications • National Applications • Patent Cooperation • Total Applications 	62 21 7 90
c. Number of patents issued	43
d. Number of license and option agreements executed on institutional intellectual property (The 24 license/option agreements were for a total of 48 different UIRF disclosures) <ul style="list-style-type: none"> • In Iowa 	24 5
e. Number of license and option agreement yielding income	94
f. Revenue to Iowa companies as a result of licensed technology	\$1.99 million
g. Number of startup companies formed <ul style="list-style-type: none"> • In Iowa (Memcine, Mencuro, Tansna) 	3
h. Number of companies in research parks, incubators and graduates located in Iowa	41
i. Number of new companies in research parks and incubators	2
j. Number of employees in companies in research parks and incubators	1618
k. Royalties and license fee income	\$6.28 million
l. Total sponsored funding	\$456.5M
m. Corporate sponsored funding for research and economic development <ul style="list-style-type: none"> • In total • In Iowa 	\$44.7 million \$1.5 million
n. Iowa special appropriations for economic development in the following categories <ul style="list-style-type: none"> • Annual state appropriations for ongoing programs (TIC, ORP and CADD) • Grow Iowa Values Fund appropriations 	\$222,372 \$1,459,200
o. Estimated jobs created by SBDC clients	103

DIRECT AND HANDS-ON TECHNICAL ASSISTANCE TO BUSINESSES, FACULTY INVESTORS & ENTREPRENEURS

The University of Iowa Research Foundation

- The UIRF aspires to maximize public benefit through commercial use of UI technologies, excellence in commercialization and long term sustainability. In pursuit of this vision, UIRF’s primary functions are:
- Licensing - finding suitable partners for commercializing UI technologies and inventions
- New Ventures - identifying and developing new high growth UI technology spinout companies suitable for venture capital financing
- Intellectual property services which include protecting UI inventions through patents and copyrights, advising on intellectual property terms for Clinical Trials and Sponsored Research and executing out-going material transfers
- UIRF’s economic development emphasis is heavily focused on startup formation. Working directly with UI faculty, entrepreneurs, and investors in selecting, evaluating and developing new companies, these activities include: IP analysis for viability of proposed company products and IP protection strategies and execution; UIRF fronts the cost of IP protection.
- Due diligence on the viability of UI spinout companies
- Business model development for UI spinout companies
- Provide *Entrepreneurs-in-Residence* for high new priority UI companies
- Provide gap funding for highest priority projects
- Licensing to UI spinout companies
- Extensive mentoring and education of faculty in new company formation

UIRF continued a pilot program called the “seeker” function, with the intention to find and work with key faculty with commercialization potential. The seekers met with 122 faculty members and have recommended continued work with 79 which have potentially commercially viable technologies. To date, the activities have led to 3 additional disclosures and the formation of 3 new companies. As part of this work, UIRF - in collaboration with the ICE and commercial partners (The Entrepreneurial Development Center and Startup Midwest) managed to vet new projects, and fund proof of concept projects that could lead to new company formation. A summary of projects evaluated and forwarded in FY11 is indicated in the first table below. A Historical View of GIVF Commercialization Funding that Stimulated Start Up Activity is also provided in Appendix A.

2011 Commercialization & Business Development Funding Awards Potential of New Projects Evaluated & Supported

No.	Project	Lead Faculty	Funding Awarded \$(K)	Cumulative Awards \$(K)	Type of Award
1	Improved vaccine efficacy	Gail Bishop	40	40	Commercial. Grant
2	New, improved Anticonvulsants	Max Baker	47	87	Commercial. Grant

3	Service model and method for more accurate, rapid, and lower cost genomic sequencing	Harsha Doddapaneni	31	118	Commercial. Grant
4	Rapid bone prototyping for surgical repair of bone fractures	Donald Anderson	48	166	Commercial. Grant
5	Service model and method for rapid identification of disease-causing gene mutations	Josep Comeron (John Manak)	48	214	Commercial. Grant
6	Back pain management	Matthew Howard	25	239	Commercial. Grant
7	Natural cancer therapeutics	Zhendong Jin	Up to 2	241	Further Evaluation
8	Prostate cancer therapeutics	Paloma Giangrande	Up to 2	243	Further Evaluation
9	Biomass hydrocarbon fuels	Gary Aurand	Up to 2	245	Further Evaluation
10	Automated verification of industrial software	Cesare Tineli	Up to 2	247	Further Evaluation
11	Driving simulator for emerging markets	Rangaswamy Rajagopal	Up to 2	249	Further Evaluation
12	Production of lower cost xylitol (natural sweetener)	Michael Louie (Shuvendu Das)	Up to 2	251	Further Evaluation
13	Lower cost production of value-added chemicals and ingredients	Shuvendu Das (Michael Louie)	Up to 2	253	Further Evaluation
14	Nanoparticles for improving vaccine efficacy	Ali Salem	Up to 2	255	Further Evaluation
15	Improving photovoltaic efficiency	Johna Leddy	0	255	Not Funded
16	Diagnostics for alcoholism	Rob Philibert	0	255	Not Funded
17	Radiation hard silicone	Ugur Akgun	0	255	Not Funded
18	Patient stand enabling weight-bearing for improved imaging of foot and ankle abnormalities	Phinit Phisitkul	0	255	Not Funded
19	Mobile phone app for the magazine “ <i>The Iowa Review</i> ”	Russell Valentino	0	255	Not Funded
20	Mobile phone app for highlighting Iowa City UNESCO features	Jon Winet	0	255	Not Funded

JPEC provides one-on-one counseling to technology based entrepreneurial companies. JPEC also uses undergraduate and MBA student teams to conduct product assessments, strategic marketing assessments, and other components of an entrepreneurial business plan. Some 55 consulting projects were conducted in FY11. In addition, JPEC supports the efforts of the UIRF to vet and spin out companies based on faculty technology by providing strategic business advice and participating in business development assessments. Several programs related to hands-on technical assistance are described below.

- **FastTrac Entrepreneurial Training Program** – JPEC delivers the nationally acclaimed FastTrac® entrepreneurial training programs of the Ewing Marion Kauffman Foundation of Kansas City. The initiative prepares aspiring entrepreneurs to launch new ventures and existing companies to grow their businesses. Two classes were held in Iowa City in FY11.
- **Seminars/Workshops/Lecture Series** – JPEC hosted over 24 different opportunities last year for students, faculty and persons from the community. In FY11, over 2,100 attendees came to learn from experienced entrepreneurs on a variety of topics including: Technology Export Roundtable, various tax workshops and Entrepreneurial Boot Camp.
- **Entrepreneurial Ventures Group** – JPEC conducts a seminar series, the Entrepreneurial Ventures Group, aimed at aspiring entrepreneurship in students, faculty and members of the community at-large.
- **Wellmark Venture Capital Fund** – JPEC is the regional administrator of the \$5M Wellmark Venture Capital Fund that supports the creation and growth of new businesses throughout the state. JPEC screens applicants, performs due diligence, evaluates business concepts, and assists applicants with their business plans. JPEC partners with area angel investors, equity fund managers, lenders, the Iowa Department of Economic Development, and the Small Business Administration to help business owners secure additional venture funding.
- **Elevator Pitch Competitions** – Two Elevator Pitch Competitions were held with \$67,000 in cash prizes awarded. One contest was open to any current University of Iowa Faculty, Staff, or Graduate Assistant and 35 teams participated in the competition and the winners received \$50,000 in funds. A separate competition was held for UI students in which \$17,000 was awarded to 50 student teams.
- **New Venture Challenge** – The John Pappajohn Entrepreneurial Center and the University of Iowa Research Foundation hosted the Spring 2011 New Venture Challenge with over \$65,000 in cash prizes awarded. The New Venture Challenge was open to all University of Iowa Faculty, Staff and Students, as well as startup companies with principal addresses at the UI Research Park. Over 58 participants registered for this event.
- **Iowa Medical Innovation Group** – This unique student led program focuses on identification of solutions to clinical problems through collaborations in the Colleges of Medicine, Engineering, Business and Law. Students work on creating medical devices and/or Health IT solutions with the assistance of staff from JPEC and the UIRF and to date over 20 interesting technologies have been identified and reviewed and 4 are currently moving forward in advanced phases of development in anticipation of forming startup companies. This program, now in only its 2nd year, has attracted more than 40 students who meet weekly with faculty, staff and external business mentors.

The Small Business Development Center (SBDC)

SBDC offers one-stop assistance to small business owners by providing high quality, one-on-one counseling that is tailored to the needs of individual clients. The SBDC conducts research, counsels, and trains business owners in management, financing, and operating small businesses, and provides comprehensive information services and access to experts in a variety of fields. Educational programs are offered on topics that include taxes, accounting systems, and business planning. It also offers a wide range of training seminars concerning business skills and issues, and assists small businesses in securing Small Business Administration backed loans. In FY2011, the SBDC served 306 clients, assisted in 28 startups, and helped clients raise \$3,800,000 in financing and create 103 jobs.

DIRECT ECONOMIC DEVELOPMENT ASSISTANCE TO IOWA COMMUNITIES

John Pappajohn Entrepreneurial Center

- **Distance Certificate in Entrepreneurial Management** – The Certificate in Entrepreneurial Management is available online to students across the state of Iowa as part of Iowa Community College partnerships. Many online students combine The Certificate in Entrepreneurial Management with the UI's Bachelor of Applied Studies (BAS) or Bachelor of Liberal Studies (BLS) in order to earn their undergraduate degree from The University of Iowa. These online opportunities are offered through UI Division of Continuing Education.
- **Business Consulting Services** – JPEC offers business consulting services to entrepreneurial and startup companies around the state.
- **Okoboji Entrepreneurial Institute** – JPEC conducts an annual institute at UI's Lakeside Laboratories at Lake Okoboji that provides hands-on experiential learning for 40 undergraduates from UI, ISU, UNI, Buena Vista College and Iowa Lakes Community College about what it takes to launch an entrepreneurial enterprise.

Corridor Business Alliance

The Corridor Business Alliance was created in December 2009 and is composed of, leaders from the Cedar Rapids Area Chamber of Commerce, the Entrepreneurial Development Center, Iowa City Area Chamber of Commerce, Iowa City Area Development Group (ICAD), Kirkwood Community College, MidAmerican Energy, Priority One, Kirkwood's Small Business Development Center, the University of Iowa's Small Business Development Center, Research Foundation and Pappajohn Entrepreneurial Center. More information on this regional approach is available at <http://corridor2020.com/2009/11/corridor-business-alliance/>. The overarching goal is to identify and leverage the region's unique educational, business development and industrial assets to enhance recruitment of new companies, development of innovative startup companies and retention of existing industry.

ECONOMIC DEVELOPMENT SERVICES PROVIDED BY THE RESEARCH PARKS, INCUBATORS SIMILAR SERVICE/UNITS

The University of Iowa Research Park, BioVentures Center and Technology Innovation Center

Corporate tenants of the Park benefit from sustained relationships with UI in the form of access to specialized research facilities, library access, faculty consultation, research collaboration and access to students as interns and employees. UI resources also provide smaller companies with assistance in business planning, identifying professional service providers, introductions to local and state government agencies and the regional business community, help in identifying potential sources of investment and other funding and communications. For a list of companies and developers associated with the Research Park, BioVentures Center and Technology Innovation Center see Appendix C.

Research Park Core Facilities

In addition to campus based core university facilities, four specialized UI laboratories reside within the Research Park. These facilities provide technical support services critical to the growth of startup companies as well as University and existing industry partners. These units provide Iowa with unique capabilities that IDED and local economic development entities have utilized in recruitment of outside companies to the Park, the region and the state.

These facilities include:

Center for Advanced Drug Development (CADD)

The Center for Advanced Drug Development (CADD) is a division of the University of Iowa College of Pharmacy that offers contract analytical and quality assurance services to the pharmaceutical and biotechnology industry. CADD is U.S. Food and Drug Administration (FDA) registered and current Good Manufacturing Practices (cGMP) compliant and works closely with the University of Iowa Pharmaceuticals, housed on the central University campus. The focus of both CADD and UI Pharmaceuticals is the manufacture and control of clinical supplies of new drugs entering initial Phase I clinical trials. They are particularly attractive to smaller pharmaceutical/biotechnology companies that have new drugs moving into the clinic but have not developed their own manufacturing capabilities.

CADD and UI Pharmaceuticals have an extensive recurrent client base of mainly smaller biotechnology companies, manufacturers of pharmaceutical excipients, and a growing pool of U.S. and foreign pharmaceutical firms. CADD and UI Pharmaceuticals are particularly well positioned to work directly with discoveries from Iowa university research laboratories, thereby providing an opportunity to hasten technology transfer and shorten the time to market. The presence of these FDA registered facilities along with the Center for Biocatalysis and Bioprocessing makes UI unique among US universities to facilitate the development of new therapeutics from pharmaceutical and biotechnology based companies as well as serving to enhance the translational science research occurring within the University of Iowa.

Center for Biocatalysis and Bioprocessing (CBB)

The Center for Biocatalysis and Bioprocessing is a microbial research, pilot plant and education center reporting to the Vice President for Research and Economic Development. The center links university scientists from 6 different colleges who focus on biocatalysis and bioprocessing. The Center also performs process research and development including fermentation and bioprocessing of food products, biofuels, bio-pharmaceuticals and other products of biotechnology. The center collaborates with industries and is capable of working from small molecules to complex proteins, including such products as alcohols, vaccines, antibiotics, anticancer drugs, polymers, biochemicals, enzymes, pharmaceutical intermediates and derivatives of bioactive compounds. In the Research Development and Process Laboratory, we can conduct extensive process research including first level production from the bench-scale to 1000 liter fermentation. The center also has a current Good Manufacturing Practices (cGMP) production facility for biotherapeutics (products produced under cGMP conditions can be used in Phase I human clinical trials) at a scale of up to 300 liters.

The CBB is central to the University's efforts to attract Biotechnology R&D and industrial fermentation companies to Iowa. CBB has worked with ICE, IDED and other Iowa economic development agencies to recruit companies to Iowa. The GIVF funded cGMP laboratories has already put CBB as the leading bioprocessing facility in a US university setting. In 2008, CBB opened the GMP, a state-of-the-art fermentation and bioprocessing laboratory to produce biotherapeutics for Phase I human trials. This new facility will position UI on the cutting edge of biotherapeutics production. In FY11, CBB began technology transfer for production of pyruvic acid based upon patented processes developed at the CBB and this has since been licensed to a major Iowa Bio Based company.

National Advanced Driving Simulator (NADS)

The National Advanced Driving Simulator (NADS) is a center for driving simulation excellence located at the University of Iowa's Research Park. Development and research conducted at the NADS – sponsored by government, military, and industry partners – saves lives, improves quality of life for motorists, advances the state of the art in driving simulation, and improves the efficiency and productivity of the vehicle manufacturing

sector. This facility is home to the world's most advanced research driving simulator, the NADS-1, as well as a collection of specific and general purpose driving simulators, including the MiniSim™. Recent research at NADS has focused on electronic stability controls systems, detection of impaired drivers, distracted driving, novice driver education, remedial safety training of fleet drivers, at-risk populations (older and younger) and assessment of the effects of pharmaceuticals.

State Hygienic Laboratory (SHL)

The State Hygienic Laboratory (SHL) has provided health and environmental laboratory services to the state of Iowa for more than 100 years. The SHL performs 175 different clinical laboratory tests in maternal screening, newborn screening, virology, serology, microbiology, molecular biology, blood lead screening and biological and chemical terrorism response. SHL uses state of art chemical, biologic and enzymatic analytical methods. These laboratories also serve as important training facilities and can perform fee for service analyses for companies at the UIRP and throughout Iowa and the Midwest. The new 113,665 sq. ft. State Hygienic Laboratory facility opened in the fall of 2010. The State Hygienic Laboratory also offers unique training facilities for companies and personnel associated with the clinical laboratory specialties, as an experiential education site for community college students studying clinical laboratory chemistry and will serve as a training headquarters through live and distance learning for public health professionals across Iowa.

COLLABORATION FOR ECONOMIC DEVELOPMENT WITH IOWA ENTITIES

Startup Company to Commercialize Animal Models of Human Disease

UI, Trans Ova Genetics of Sioux Center and the IDED have collaborated to support a startup company that will develop animal models of human disease, an important tool for the research community in its effort to discover and develop new cures for diseases. The effort began with the work of UI's Michael Welsh, MD, an investigator who has studied the development of cystic fibrosis (CF) for more than 15 years. Dr. Welsh developed an animal model for this disease as a part of his investigation. The collaboration with Trans Ova Genetics will allow a mechanism for translation for broader use as a research tool. A \$400K Battelle award also supported a part of this development. A new company was formed, Exemplar Genetics, in which Trans Ova owns a minority share. The IDED supported further development of the business with a \$1M forgivable loan awarded to UI to support three related projects: 1) development of a small pig facility to support the work, 2) development of a molecular biology laboratory to support the work, and 3) further R&D into the CF model and perhaps one additional animal model of human disease. In FY11, Exemplar raised over 2.4 million dollars in SBIR/STTR funding and has begun selling the pigs developed at the UI to researchers throughout the country. In addition to cystic fibrosis, Exemplar is developing models of cardiovascular disease, cancer, neurodegenerative disease, and muscular dystrophy, among others.

Shovel Ready Site Initiative/Certification

The Shovel Ready Site Program initiative was spear-headed by the Iowa City Area Development Group. The program is designed to give the UI Research Park a competitive edge in the site selection marketplace. The goal of the program is to have selected sites shovel ready, connections to utilities and other physical infrastructure, clear swift procedures for permitting and incentive programs that can be quickly applied to a project. The UI Research Park, along with two other area sites, was chosen as a pilot project site. Gaining shovel ready certification provides a very positive boost to recruitment of technology based companies to UI Research Park and multiple additional sites are nearing shovel ready classification as the interest in locating within the Park continues to grow.

IAWind

The University of Iowa, and particularly the College of Engineering, took the lead in working with IDED to create the Iowa Alliance for Wind Innovation and Novel Development (IAWind), a virtual organization established to promote the wind energy industry in boost to Iowa. This collaboration includes:

- The Regents Universities
- Iowa Community Colleges
- State Agencies (IDED, DNR, Office of Energy Independence)
- Federal Agencies (NSF, DOE)
- Iowa Wind Industries
- Community Partners (Iowa Energy Center, Iowa Wind Energy Association)

The organization comprises components related to policy, research, training and education, and testing facilities. The impetus for this organization arose as the College of Engineering was assisting the Iowa Department of Economic Development in its efforts to recruit wind energy companies to the state, and the need to identify and integrate the state's wind energy assets became obvious. For more information: <http://www.iawind.org>

Iowa NSF EPSCoR

The 3 Board of Regent Institutions, working with state government, the community colleges and industry led a successful effort to win a highly competitive 5 –year, \$24M year grant from the National Science Foundation. The program, known as EPSCoR (Experimental Program to Stimulate Competitive Research) is focused on enhancing the quality of faculty and their competitiveness for additional federal funding, focusing on enhancing the state's renewable energy goals, leveraging linkages with industry and Iowa economic development entities and increasing the pool of Iowan's well trained in the Sciences to allow to compete in the 21st century global economy. A state EPSCoR coordinating committee comprised of University, Community College, Industrial, Governmental and legislative leaders will oversee the ongoing programs and identify new directions as well as leveraging opportunities where Iowa communities can benefit directly from the work on the grant. The link to renewable energy, competitiveness. STEM education and workforce development also fits well with Governor Branstad's vision for innovation, economic development and STEM education on a statewide level.

The University of Iowa linkages to the Dubuque Sustainable City Program

The University of Iowa's strong commitment to community economic development is illustrated in two major projects with the City of Dubuque.

Sustainable Dubuque Watershed Network – this joint research project led by Professor Jerry Schnoor at UI utilizes high frequency sensing of water resources using an embedded sensor network to develop a watershed network and intelligent digital watershed for the North Fork of Catfish Creek in Dubuque with an eye towards understanding, modeling and predicting the infiltration and inflow to the sanitary sewer system which creates unwanted by-pass flows.

University of Iowa Sustainable Dubuque Initiative – this joint effort between the City of Dubuque and The UI School of Urban and Regional Planning is focused on helping Dubuque validate and actualize the specific approaches they plan to take going forward and involves graduate students from UI working local college students and city leaders on several projects over the next two years which include:

2011-12 Projects

- Indicators and indicator measurements for the 11 sustainability principles.
- Renewable energy asset mapping
- Portrait of poverty in Dubuque

- Local foods and local institutions
- Design of Green and Healthy Homes program

2012-13 Projects

- Survey of best practices for land pricing and general plans for redevelopment of port areas
- Commercial/residential redevelopment plan for Washington neighborhood
- Opportunities for integrating city, school, and regional transportation systems.
- Determination of real housing need

Additionally Urban and Regional Planning students have had ongoing projects in Decorah, Wellman, Anamosa, and Columbus Junction in the past and have ongoing projects in Burlington, Decorah, Oskaloosa and Charles City in addition to the Dubuque projects.

University of Iowa/Kirkwood Community College STEM Innovation Center

Joint planning of an innovation campus to identify new models for STEM education and workforce development for Iowa by the University of Iowa, Kirkwood Community College and the Iowa City School District has led to a recent voter approved bond referendum which will enable the construction of such a center on the University of Iowa Research Park Campus. To our knowledge, this is the first of its kind where faculty from all three education sectors will work together to develop and evaluate new models of STEM education. High school and community college students will have access to Advanced College courses in STEM and will benefit from internships and other experiences in our state-of-the-art park facilities (NADS, SHL, CBB, and select other companies) as well as the rich laboratory and clinical resources on the UI campus.

GROW IOWA VALUES FUND (GIVF)

GIVF Impact for the University of Iowa and the Iowa Centers for Enterprise (ICE)

Over the past 6 years, GIVF has provided UI critical support to build the infrastructure needed to better transform UI faculty discoveries into new businesses and/or licensing opportunities. Funds have been used in the following general categories:

- to stimulate commercialization and provide proof of concept funding for promising UI research
- create an infrastructure through personnel and facilities to support growing startup companies within the University the UI Research Park campus
- provide comprehensive entrepreneurial education and business support programs
- lead regional economic development strategy for the Cedar Rapids/Iowa City/Coralville corridor and work closely with existing industry in terms of science and business development

Success Stories Based on UI Technology with GIVF Proof of Concept Support

ASL Analytical, Inc. was provided GIVF funding proof of concept funding in 2005, the company was established in 2006 and are currently located at the BioVentures Center at the UI Research Park and currently has 7 total employees. <http://asl-analytical.com/>

Mark Arnold and Gary Small were researcher collaborators in the Department of Chemistry. Their idea was to develop chemical sensing technology that can be used to monitor the concentrations of critical chemical constituents within a process of interest. The key is the ability to monitor these concentrations accurately, non-destructively and in real-time, thereby providing a means for feedback control and enhanced productivity. Their plans are to develop this technology for a multitude of sensing applications in the biopharmaceutical industry, include protein expression by E. coli and CHO cells. They are also exploring the translation of this sensing technology into the intensive care unit (ICU) to improve medical treatment of critically ill adult, pediatric and neonatal patients. Since 2006, ASL has secured over \$2.6 million in funding from a variety of sources including private investors, SBIR funding from NSF, NIH, and the U.S. Army, and industrial grants and contracts. Efforts to match NSF SBIR Phase IIB funding are underway as a way to fund employee expansion.

Terpenoid Therapeutics was provided GIVF funding proof of concept funding in 2005. The company is currently located in the University of Iowa Research Park in the BioVentures Center Incubator and currently has 6 employees. <http://www.terpenoid.com/> Terpenoid Therapeutics, Inc. is a spin off cancer drug discovery and development company based on the intellectual property from the research of Drs. David Wiemer and Raymond Hohl in Chemistry and Oncology, respectively. The company has been successful in multiple SBIR grant applications, the IDED DEMO fund as well as in raising significant private capital and has two lead compounds approaching Phase I human clinical trials. Since 2005, the company has raised over \$2M in external funds including IDED demonstration funds (\$150K), Series A funding (\$1.5M) and SBIR/STTR (\$414K).

**Grow Iowa Values Fund projects for
FY 2010 – FY2011**

GIVF Program Summary	Description of Program	FY11 – GIVF Expenditures From FY10 and FY11	Progress through June 30, 2010 ROI DATA
		Match Funds Source	
<u>VP for Research</u>	These funds have been instrumental in enabling UI to expand the economic development infrastructure. These funds supported critical economic development functions associated with University Research Park, BioVentures Center, Technology Innovation Center and IOWA Centers for Enterprise.	FY 2011 \$879,349 MATCH: Ryan Companies, UI Biology Department and UI Research Park Corporation in-kind contributions \$449,704	Satellite offices for ICE units have been established at BVC. This will provide tenant companies direct access to experts to help move their business development goals. Preferred vendors selected for critical UIRP infrastructure including a fitness facility and a day care facility for park companies, Our collaborative internal economic development organization is leading efforts of the Corridor Business Alliance to create a regional economic development strategy for the Cedar Rapids/Iowa City/Coralville corridor Staff support for UIRP, BVC and TIC Annual entrepreneurial education and celebration event that highlighted ICE accomplishments as well as recognize UI faculty, staff and students for entrepreneurial awards.
<u>BioVentures Center and University of Iowa Research Park</u>	The BioVentures Building was made possible by a collaborative partnership between Ryan Companies and the University of Iowa. The new building provides critical space and services for life science startup companies at the University of Iowa Research Park. The BioVentures Center will use these funds to pay debt associated with the construction of the new BioVentures Building.	FY 2011 \$492,500 MATCH: UI BioVentures Center in-kind contribution \$246,250	65% of leasable space at the BVC and 77% of leasable space at TIC. Nine companies (ASL Analytical, Bio::Neos, Cellular Engineering Technologies, CQM Systems, Exemplar Genetics, KemPharm, Inc., Terpenoid Therapeutics, Inc., Vertex Pharmaceuticals and VIDA Diagnostics) New shared lab space built out in BVC to support early stage companies in their pursuit of external funding including SBIR The University of Iowa Research Park has achieved shovel ready certification.

<p><u>John Pappajohn Entrepreneurial Center</u></p>	<p>To fund expenses associated with training, consultation and outreach for Iowa entrepreneurs. JPEC continues to expand outreach programs for Iowans: 1) Support the development, implementation, and expansion of entrepreneurship programs; 2) Enhance support for faculty and area technology and high potential startup and early stage companies through one-on-one consulting, education seminars and workshops, and student/faculty field study projects and 3) Continue support for elevator pitch and business concept competitions for UI-based new and emerging ventures.</p>	<p>FY 2011 \$376,393</p> <p>MATCH: JPEC in-kind contribution \$175,307</p>	<p>Employed a Project Manager to work with UI faculty / staff / students in the areas of strategic business planning, market research, operations and financial assessment. Project manager also identified and managed projects for existing Iowa-based companies to work with UI student consulting teams.</p> <p>JPEC hosted over 24 different opportunities last year for students, faculty and persons from the community. In FY11, over 2,100 attendees came to learn from experienced entrepreneurs on a variety of topics including: Technology Export Roundtable, various tax workshops, and Entrepreneurial Boot Camp</p> <p>JPEC held various elevator pitch and business plan competitions for UI faculty, staff and students. 308 entrepreneurs participated and 55 received a total of \$80,000 in seed funding.</p>
<p><u>Center for Biocatalysis & Bioprocessing</u></p>	<p>To expand into a dedicated bioprocessing support for industrial biotechnology companies at the CBB. Currently, CBB is deficient in performing these operations, which have the potential to convert soy and corn residues to fuels and chemicals. CBB has experienced a surge in these activities. This reflects the surge in DOE and Venture funding into companies involved in this area.</p>	<p>FY 2011 \$549,758</p> <p>MATCH: CBB in-kind contribution \$274,879</p>	<p>CBB achieved \$2.5 million in revenue in FY11.</p> <p>Several 30 L fermenters and recovery equipment have already been installed as a first step towards establishing full capability in the industrial biotechnology area.</p> <p>In FY11, CBB began technology transfer for production of pyruvic acid. This technology has been licensed to an Iowa company. The company is further scaling up this technology for large scale production.</p>
<p><u>University of Iowa Research Foundation (UIRF)</u></p>	<p>UIRF focused on two primary activities: 1) continue its contribution to the integrated model of new company formation and 2) educate faculty in key colleges and departments towards identifying viable technology that has potential to create intellectual property that can be protected and lead to new companies and/or licensing opportunities. Since University derived intellectual property is by nature very nascent in terms of its readiness for forming companies and attracting additional investment capital, GIVF has been critically important to assist in establishing proof of concept in several of our most exciting technologies in advance of forming companies. These funds also are very helpful in helping attract additional proof of concept funds from federal and private sources</p>	<p>FY 2011 \$828,215</p> <p>MATCH: UIRF in-kind contribution \$414,000</p>	<p>Funds were utilized to support existing projects that continue to demonstrate commercial merit. This support included specialized entrepreneurs-in-residence, technology experts, external grant identification and application, intellectual property evaluation and strategy, external partnership development and assistance in securing investment.</p> <p>GIVF Seed Grant Program. GIVF funding has been critical in creating a culture of commercialization and enabling the creation of highly innovative startups based on faculty research. GIVF investments can be directly linked to 13 existing local startups as of FY10, 2 more were formed in FY11 and 4 others are in formation stages for a current running total of 19. See Appendix A for Historical perspective of GIVF funding that Stimulated Start Up Activity</p>

EMERGING TRENDS IN UNIVERSITY ECONOMIC DEVELOPMENT AND TECHNOLOGY TRANSFER

Emerging Trends- There has been a clear focus among major research universities to enhance their infrastructure to more effectively move important research findings towards commercialization for the benefit of society as well as to maximize economic value. National conferences held by early stage investors and conferences held by university tech transfer groups are merging. Experienced business and new venture development professionals are becoming common place in university tech transfer organizations, and university tech transfer conferences are presenting relevant business and new venture sessions. Successful university research parks have vibrant laboratory- based business incubators that provide both facilities and active business support programs for their startup companies. Most successful university business incubators are constructed debt free, or very close to it. Graduate space for incubator companies – sometimes called accelerator space – is becoming a mainstream program to support companies as they graduate from life science and IT incubators.

Available Capital- Due to the very early stages of most technology based University Research, the access to proof of concept capital investment remains a critical element for continued success. GIVF funding has been critical to UI success to date and has enabled us to build an infrastructure to enhance our ability to identify high value technologies that could lead to commercialization in the future. Aside from this type of state funding, federal support through SBIR/STTR programs remains a vital program that enables competitive vetting of new ideas and technologies and in some states matching programs to federal support has enhanced technology transfer greatly. Without this early stage investment many of our nascent technologies and very early stage companies will fail in one of the many Valleys of Death along the technology transfer pipeline as most other investments, including some of Iowa's existing programs are focused on more established companies and technologies to insure financial viability.

New Programs- Most universities see only a few percent of technologies commercialized, typically because of lack of proof of concept for these innovations. As such, this is an area of growing focus for universities. New programs are focused on establishing the means for proof of concept that can lead to an interested commercial partner and the required capital to bring innovations to market. One example is to extend the concept of Entrepreneur-in-Residence which is applied to new startups, to Commercialization. These individuals are being attracted to universities for their combined technology and business expertise to help faculty invent for specific market needs, versus the more historical serendipitous approach. Another innovative program is the Iowa Medical Innovation Group. This is an interdisciplinary endeavor between JPEC, the TCOB, Carver College of Medicine, College of Engineering, and College of Law. The primary objectives of this program are to provide advanced students a working knowledge of all phases of medical device / technology development and to commercialize new medical innovations.

Alignment with State and Regional Priorities and Cluster industries – working closely with the IDED as they develop their Innovation Council universities are strategically positioned to support the state's three science and technology platforms of biosciences, advanced manufacturing and IT. They are also working across all 3 Regents institutions to develop strong infrastructure to support renewable energy. This alignment is crucial for Iowa's success in terms of science and technology infrastructure, workforce development and alignment with state and regional economic development assets need to create and recruit key companies in targeted areas. In the case of UI our local targeted industry clusters include Wind Energy, Food Processing and Biotechnology and the university continues to align itself to support growth in these areas.

Faculty Cluster Research Priorities – As a major strategy to focus our investments on our most successful research programs we have initiated hiring strategy revolving around clusters of faculty focused on societal problems of major importance and with high probabilities for attracting external funding. Thus in 2010 a faculty cluster hires in Water Sustainability were made across 6 colleges and we have current clusters forming in Aging, Obesity, Genetics and Public Humanities, all involving multiple colleges, and in some cases also linking with ISU and UNI. In each of these areas we were working to identify faculty who will also have as a high priority an interest in motivating their colleagues to focus on commercialization and technology transfer related to this “grand challenges”.

Appendix A

Summary of Historical GIVF Commercialization Funding Stimulating Startup Activity

2011	GIVF Funded Projects	Potential Startup Identified	Startup Formed	Year	Company Name	Startup Is On-Going	Remains Under Consideration for Startup	GIVF stimulated What Result
Anderson	1	√	√	2011	FxRedux LLC	Yes	√	Startup Formation
Baker	2	√	√	2010	Memcine	Yes	√	Startup Formation
Doddapaneni*	3							
Manak*	4	√					√	Startup Interest
Bishop	5	√	√	2010	Mencuro	Yes	√	Startup Formation
Howard	6	√					√	Startup Interest
2010								
Schultz	7	√	√	2009	ViewPoint Mole. Diag.	Yes	√	Startup Formation
Adams	8	√					√	Startup Interest
McCray	9							
Lim	10	√	√	2007	JL Meditech	No		
Leddy	11	√	√	2009	Voltesla	No	Techs licensed to partners	Startup Formation
2007								
Abramoff	12	√	√	2009	IDX	Yes	√	Startup Formation
Arnold	13	√	√	2005	ASL Analytical	Yes	√	Industry Partner
Hohl	14	√	√	2005	Terpenoid Therapeutic	Yes	√	Private Financing
Welsh	15	√	√	2007	Exemplar Genetics	Yes	√	Startup Formation
Wolgennaunt	16	√	√	2006	OMR Sensors	No		
TOTAL	16	14	11			8	11	

1. Original company is no longer viable
2. Voltesla performed technology proof of concept work; technologies were subsequently licensed to other commercial partners; the startup co. is no longer needed. Original company is no longer viable

Appendix B

Name of Business or Other Entity Served	City and County where this Project is in Place		University Unit that interacted with business or other entity
	City	County	
BUSINESS INCUBATOR TENANTS			
AMBI Group	Coralville	Johnson	Technology Innovation Center
ASL Analytical	Coralville	Johnson	BioVentures Center
Bio::Neos, Inc.	Coralville	Johnson	BioVentures Center
Cellular Engineering Tech.	Coralville	Johnson	BioVentures Center
Componica, LLC	Coralville	Johnson	Technology Innovation Center
Digital Artefacts, LLC	Coralville	Johnson	Technology Innovation Center
Exemplar	Coralville	Johnson	BioVentures Center
Innomatix, LLC	Coralville	Johnson	Technology Innovation Center
Corvida Medical	Coralville	Johnson	Technology Innovation Center
KemPharm, Inc.	Coralville	Johnson	BioVentures Center
Ramaanchar Technologies, Inc.	Coralville	Johnson	Technology Innovation Center
Terpenoid Therapeutics, Inc.	Coralville	Johnson	BioVentures Center
The Thomas Group	Coralville	Johnson	Technology Innovation Center
Vertex Pharmaceuticals	Coralville	Johnson	BioVentures Center
VIDA Diagnostics	Coralville	Johnson	BioVentures Center
Kepa Services	Coralville	Johnson	Technology Innovation Center
SantosHuman, Inc.	Coralville	Johnson	Technology Innovation Center
RESEARCH PARK TENANTS			
LMS North America	Coralville	Johnson	UI Research Park/TIC Graduate
Stanley Environmental, Inc.	Coralville	Johnson	UI Research Park
Vangent, Inc.	Coralville	Johnson	UI Research Park
Integrated DNA Technologies, Inc.	Coralville	Johnson	UI Research Park/TIC Graduate

Pearson Educational Measurement	Coralville/Iowa City	Johnson	UI Research Park
Noel-Levitz	Coralville	Johnson	UI Research Park
Cargill International	Coralville/Cedar Rapids	Johnson	UI Research Park
Brighton Group	Coralville/Des Moines	Johnson/Polk	UI Research Park
OTHER BUSINESS INCUBATOR GRADUATES ACTIVE IN IOWA			
Ecolotree, Inc.	Lowden, North Liberty	Cedar, Johnson	Technology Innovation Center
Accredo Therapeutics	Iowa City	Johnson	Technology Innovation Center
Corcoran Communications, Inc.	Iowa City	Johnson	Technology Innovation Center
Innovative Software Engineering	Coralville	Johnson	UI Research Park/TIC Graduate
Bio-Research Products, Inc.	North Liberty	Johnson	Technology Innovation Center
aJile Systems, Inc.	Cedar Rapids	Linn	Technology Innovation Center
CompuTerra, Inc.	Cedar Rapids	Linn	Technology Innovation Center
Sustainable Science	Iowa City	Johnson	Technology Innovation Center
Caviforce Technologies, Inc.	Des Moines	Polk	Technology Innovation Center
Sebesta Blomberg & Assoc., Inc.	Coralville	Johnson	Technology Innovation Center
HomeSafe	Coralville	Johnson	Technology Innovation Center
Integrated DNA Technologies, Inc.	Coralville	Johnson	UI Research Park/TIC
The Patient Education Institute	Coralville/Iowa City	Johnson	UI Research Park/TIC
Police Law Institute	Coralville/North Liberty	Johnson	UI Research Park/TIC
Goldfinch Diagnostics	Coralville	Johnson	Technology Innovation Center
Corridor Media Group	Coralville	Johnson	Technology Innovation Center
DEVELOPERS			
Myriad Developers, Inc.	Cedar Rapids	Linn	UI Research Park
TMD, L.L.C.	Solon	Johnson	UI Research Park
Midwest Development & Invest.Corp.	Fairfield	Jefferson	UI Research Park
Liberty Growth	Iowa City	Johnson	UI Research Park
Hunter Companies	Cedar Rapids	Linn	UI Research Park
S & S Developers	Iowa City	Johnson	UI Research Park
EMRICO	Iowa City	Johnson	UI Research Park
Ryan Companies, US	Cedar Rapids	Linn	UI Research Park
LMC, LLC	North Liberty	Johnson	UI Research Park

**IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

**FY11 Board of Regents, State of Iowa, Annual
Economic Development and Technology
Transfer Report**

**PRESENTED BY SHARRON QUISENBERRY, VICE
PRESIDENT FOR RESEARCH AND ECONOMIC
DEVELOPMENT**

September 20, 2011

FY11 Board of Regents, State of Iowa, Annual Economic Development and Technology Transfer Report

1. Please briefly describe the relationship of your institution's economic development activities to the enhancement of economic growth in the state. The description should cover, but not necessarily be limited to the following:

- A. the relationship between institutional activities and creation of jobs and wealth in Iowa
- B. Institutional activities and services which indirectly promote economic development, such as training provided to staff of local economic development agencies

1A. Enhancement of Economic Growth through Job Creation and Retention, Investments, Sales, and Cost Savings

Iowa State University engages in several activities that have direct impact on both the creation as well as the retention of jobs in Iowa. The ISU Research Park is a technology community that encourages commercialization of university research. Likewise, the Innovations Development Facility, part of the Plant Sciences Institute, incubates new companies. In addition, the IPRT (Institute for Physical Research and Technology) Company Assistance Program, ISU Extension's Outreach Center for Industrial Research and Service (CIRAS), the Small Business Development Center (SBDC) and the ISU Pappajohn Center for Entrepreneurship interact with companies across Iowa to solve production and management problems. These interactions lead to the resolution of problems related to product development and business management. As a consequence of the improved production resulting from these interactions, businesses have been able to retain and often expand their work force. Some examples of the direct impact that these ISU units have had this past year are as follows:

- The ISU Research Park continues to be successful in initiating as well as nurturing numerous new businesses. Nine new companies and affiliates have joined the Park in FY11, bringing the historical total to 210 companies, research centers, and affiliates. Currently, there are 53 companies, research centers, and affiliates located in the Park, employing 839 people.
- There are currently four faculty-affiliated start-up companies located in the Innovations Development Facility, the on-campus business incubator in the Roy J. Carver Co-Laboratory under direction of the Plant Sciences Institute. The PSI met with three entrepreneurs interested in forming Limited Liability Corporations involving plant science. They are currently working with these individuals and ISURF (Iowa State University Research Foundation) to develop SBIR phase I proposals to be submitted to USDA and NIH. A total of 15 companies have used this business incubator space since the facility opened in September 2003.
- A summary of project evaluation data clearly shows that Iowa companies with technical problems and research and development needs continue to find important technical help through the services of IPRT Company Assistance. Companies report positive impacts affecting their sales, investments, and operating costs despite the economic recession of 2009-2011. Of the IPRT clients responding to the survey, the estimated impact of projects conducted in FY10 was \$16.9 million; the average impact over the last 5 years is \$12.8 million

per year. Companies also estimated over twenty-four jobs were created or retained each year from 2005-2010, with twenty jobs retained or created from projects surveyed in the past year. The satisfaction rating given by clients during the past year is 4.8 (1-5 scale, with "1" being "is not satisfied" and "5" being "very satisfied").

- BodyViz, a spin-off company from IPRT's Virtual Reality Applications Center, was named Breakout Company of the Year for 2011 at the Technology Association of Iowa's Prometheus Awards ceremony in April. The awards are recognized as Iowa's largest and most prestigious awards devoted to promoting and celebrating the innovation and high-tech excellence in Iowa. The company, founded in 2007, is the maker of BodyViz software that creates 3D MRI, CT scan visualizations, unlocking medical imaging for the practicing surgeon, diagnostics and treatment. The company is located in the Iowa State University Research Park. It has 3 full-time and 4 part-time employees.
- Catilin Inc., a spin-off of IPRT's Center for Catalysis (CCAT), has been acquired by Albemarle Corp. of Baton Rouge, LA. Catilin, founded in 2007, is a technology leader in development and application of heterogeneous biodiesel catalysts. The company will restart Catilin's pilot plant operation at the Iowa Energy Center's Biomass Energy Conversion (BECON) Facility in Nevada, Iowa, to test catalysts on different feedstocks for reducing the cost of producing biodiesel, with the goal of running the facility 24 hours a day, seven days a week. Two former students of the late Victor S.-Y. Lin, Catilin founder, director of CCAT, and a professor of chemistry at Iowa State University, will be staying with the company.
- The Extension and Outreach Center for Industrial Research and Service (CIRAS) has a mission to improve the quality of life in Iowa by enhancing the performance of industry through applied research, education, and technical assistance. Cumulatively, over the past five years, CIRAS and its partners have reported impact from companies totaling more than one billion dollars (new investments \$331 million, costs saved or avoided \$83 million, sales gained or retained \$960 million) with 18,255 jobs added or retained as a result of the assistance they received.
- In FY11, 1,235 businesses from 95 counties in the state received assistance on projects or attended educational workshops from CIRAS staff or partners. Companies responding to surveys reported \$43 million in new investments, \$19 million in costs saved or avoided, and \$331 million in sales gained or retained. Company executives stated that 6,037 jobs were added or retained as a result of the assistance they received from CIRAS and partners.
- Over 750 participants were trained in FY11 by attending conferences and workshops offered through a partnership of CIRAS, Civil, Construction, and Environmental Engineering, Electrical and Computer Engineering, Alliant Energy, Black Hills Energy, CIPCO, the Iowa Association of Electric Cooperatives, Iowa Association of Municipal Utilities, Iowa Energy Center, MidAmerican Energy, and the Iowa Office of Energy Independence. Energy short courses educated participants on motor systems management with a goal of improving energy efficiency in facilities. Continuing education was provided for civil engineering practitioners in engineering survey, structural engineering, transportation

engineering, geotechnical engineering, water resources and flood management, and environmental engineering. Attendees were able to obtain professional development hours towards retention of their Iowa engineering licenses.

- CIRAS government contracting specialists work with Iowa businesses, from one person operations to some of the state's largest employers to help them understand the government procurement process and to secure contracts. As the only organization in the state of Iowa providing contracting assistance at all three levels of the government market segmentation – local, state, and federal – CIRAS staff provided counseling to more than 800 companies. Companies reported over \$203 million (an eight percent increase over FY10) in government contract impact due in part to the assistance they received. The Defense Logistics Agency, which funds CIRAS to provide assistance to Iowa companies, indicated this impact helped create or retain over 4,000 jobs.
- In 2011 CIRAS, working with the U.S. Department of Agriculture (USDA) and ASTM International, developed and initiated the USDA Biobased Product Certification and Labeling Program. The new label makes it easier for customers to identify biobased products, as well as serving as a valuable marketing tool for the manufacturers and vendors of the products.

As the manager of the biobased product certification and labeling program, CIRAS facilitates the label usage applications from manufacturers, vendors, and industry associations. Staff also implements quality control and corrective action procedures to maintain the level of excellence expected of the USDA brand.

In addition to the labeling and certification program, efforts by CIRAS staff increased the database of biobased products available for consideration under the BioPreferred program to 483 Iowa products sold by over 90 Iowa manufacturers and vendors. Nationally 26,654 products sold by over 3,300 companies have been identified.

- CIRAS is working with the BEST of Iowa (Business Expansion and Strategic Trends), a partnership of Iowa utility concerns, Iowa Department of Economic Development, Iowa Workforce Development and Iowa Department of Education to provide a statewide coordinated business retention and expansion program. Economic Developers throughout the state use the Synchronist data system to interview executives of Iowa industries to create a Competitive Capacity Scorecard for the state. CIRAS worked with this group to include interview questions concerning research and development and product design. Comparison of industry segments to other states has begun. This information will assist economic developers in focusing on high value, high growth companies that may be facing challenges with their mature products.
- During FY11, the Small Business Development Center (SBDC) provided business assistance to companies, involving 2,786 clients and 11,641 counseling hours. They also conducted 351 training workshops in which 4,017 individuals participated.
- The ISU SBDC, along with the ISU Pappajohn Center for Entrepreneurship, provided 571 hours of counseling assistance to start-up and existing companies;

served 127 clients with one-on-one counseling; educated 404 attendees through workshops; provided advice to several hundred clients via telephone and email; and advised 7 technology companies in the areas of licensing, equity based financing, market entry, and numerous operational areas.

- Every year the SBDC commissions Professor James J. Chrisman to review the economic impact of the SBDC's clients who receive five or more hours of counseling from the SBDC, which account for only 20% of the total SBDC client base. In a report on this client segment published by Professor Chrisman, *Economic Impact of Small Business Development Centers (SBDC's)*, it was shown that for every \$1.00 in state and federal funding in FY09, the total tax dollars returned to the State of Iowa and the federal government by SBDC clients in 2010 was \$.94. Among these clients there were 831 jobs retained, 403 jobs created, and nearly \$12 million in new sales. The SBDC helped these clients raise over \$70 million in financing for their businesses.
- Technologies originating at ISU and licensed to Iowa companies have resulted in over \$86 million in sales by those companies in calendar year 2010. Total sales of ISURF-licensed technologies were \$627 million, not including germplasm.
- The Office of Intellectual Property and Technology Transfer began supporting SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer) outreach efforts in FY06. Since then, SBIR and STTR funding in Iowa has rebounded. In FY11, eighteen different Iowa companies won twenty-seven new or continuing SBIR and STTR awards worth \$7.1 million. This is a slight decrease from FY10, but the figure remains significantly higher than in FY06 and FY07 and is the second year it has surpassed \$7 million. An emphasis has been placed on outreach and training activities. This includes a monthly newsletter and workshops presented by Federal program managers. In addition, comprehensive proposal preparation support has contributed to an increasing number of companies applying for funding. Twenty-two Iowa companies were assisted in the preparation of twenty-five proposals during FY11, including five Iowa State faculty or staff-related companies. The funded projects reflect Iowa's strengths in biotechnology, information systems, materials development and agriculture. Over \$2.8 million in support was awarded by NIH for diverse projects that range from the development of medical devices and vaccines to new cancer drugs and new animal models for human diseases. An additional \$2.3 million was received from the National Science Foundation for projects that include bioreactors, novel sensors, improved quality control for medical imaging procedures and electricity generation.
- The ISU Grow Iowa Values Fund program has a competitive research component that pairs ISU faculty members with Iowa industries to create economic benefit for the companies. Surveys completed by companies on projects funded from June 2006 – June 2009 (surveyed one year after project completion) documented more than 100 jobs created or retained and an annual sales impact of more than \$14 M impact due to the research projects conducted in partnership between ISU and the companies.

1B. Training Opportunities for Staff of Local Economic Development Agencies and Other Activities that Indirectly Promote Economic Development

- As part of the College of Engineering efforts to help grow the wind industry in Iowa, the college hosted a training session on Vistagy FiberSIM, a design and manufacturing software for composite layout. The session was attended by ISU researchers, engineers from TPI Composites, and Sandia National Laboratories.
- The College of Engineering and ISU Extension and Outreach Center for Industrial Research and Service (CIRAS) in partnership with the Iowa Alliance for Wind Innovation and Novel Development (IAWIND) acquired metrology equipment to support Iowa industry. The Faro laser tracker is used in student courses, to support research, and to assist Iowa companies. Support to industry will be enhanced by the recent acquisition of an articulated arm with a laser scanner.
- CIRAS developed and delivered a training curriculum for Iowa businesses to provide education on new compliance requirements regarding the Federal Funding Accountability and Transparency Act (FFATA). The FFATA legislation requires information on federal awards be made available to the public via a single, searchable website for the purpose of increasing government accountability. Five workshops and one-on-one counseling sessions were held throughout the state with over 100 businesses receiving assistance. This training provided companies with the necessary tools to meet their reporting requirements as federal vendors.
- As flooded rivers throughout the Midwest strained levees to the breaking point, CIRAS educated businesses regarding the importance of flood emergency planning. A flood emergency planning checklist was distributed directly to over 300 western Iowa companies. In addition, Safeguard Iowa, Iowa Workforce Development, Iowa Innovation Gateway, Iowa Association of Business and Industry, North and South Dakota Manufacturing Extension Partnership, Nebraska Manufacturing Extension Partnership, Nebraska Procurement Technical Assistance Program, and the Siouxland Chamber of Commerce provided the checklist to over 2,000 additional business leaders and company executives.
- In 2011 CIRAS was engaged in nine significant research projects in support of the biobased products industry. Efforts were focused on two major areas of importance to industry: economic impact and barriers to development and adoption.

Collaborating with faculty from the Colleges of Engineering and Design, CIRAS researched improvements in performance and processing of biobased products as well as breaking down barriers to consumer adoption. Outcomes included the development of a methodology for cutting and welding biobased plastic film using ultra sonic energy, resulting in a patent disclosure being filed with ISURF, and the development of testing resources at ISU for evaluation of compostability of plastics.

Using the expertise of faculty and staff from the Survey and Behavioral Research Services, the College of Agriculture and Life Sciences Department of Economics, and the College of Liberal Arts and Sciences Sociology Department, CIRAS research focused on developing benchmark data, industry input, and increased knowledge of potential growth and impact of the biobased products industry. Reports on the analysis of the biobased products industry survey data and the biobased manufacturer index pilot survey were released.

Ongoing research in consumer acceptance of biobased products, recycling impacts for biobased products, and continuing industry input surveys will help expand and improve the growth and impact of this important economic sector.

Nearly 500 people attended Iowa's Advanced Manufacturing Conference: Manufacturing in the Global Economy. CIRAS partnered with the Iowa Association of Business and Industry (ABI), the Des Moines Area Community College (DMACC), and Rockwell Collins to provide education and discussion on a broad range of issues affecting manufacturing in the Midwest.

- The Electric Power Research Center (EPRC) is a consortium of eleven utilities that sponsor multidisciplinary power systems research at Iowa State University. Nine of the eleven companies provide services in Iowa; the remaining two are international. Funds provided by the companies are used to conduct research on the reliable and economic operation of power systems. In addition, the research deals with the integration of increasing amounts of wind energy into the grid and the implications of the electrification of transportation. EPRC research helps assure that Iowa, the U.S., and the world have a supply of electric power that is cost-effective, reliable, and sustainable.
- Keeping the pipeline full of youth interested in STEM fields is a key component of Iowa's economic development plans. Participants from every Iowa county engaged with the College of Engineering and its industrial partners to inspire the next generation of Iowa's STEM workforce. The College of Engineering plays a vital role in this effort because of the need for engineers in Iowa companies. The College provides leadership for K-12 efforts, including Project Lead the Way, FIRST Lego League, Junior FIRST LEGO League, engineering kids camps, Mom's Night out for STEM, and more. In FY11, over 620 K-12 students engaged in summer camp activities, 242 FIRST LEGO League teams were formed, and over 143 Project Lead the Way sites offered pre-engineering curriculum to middle and high school students.

2. Please provide the following information for FY11: (If your institution utilizes additional metrics specific to your institution's specialized areas of research or service, please include them here)

Note: Unless noted, the data provided below are FY11 data.

- a. Number of disclosures of intellectual property: 106
- b. Number of patent applications filed: 47
- c. Number of patents awarded: 25

- d. Number of license and option agreements executed on institutional intellectual property, in total and in Iowa: 49 total, 19 in Iowa
- e. Number of license and option agreements yielding income: 217
- f. Revenue to Iowa companies as a result of licensed technology: \$86 million (CY10)
- g. Number of startup companies formed, in total and in Iowa (through licensing activities): 2 total, 2 in Iowa
- h. Number of companies in research parks and incubators: ISU Research Park: 40 private and 13 university-related; Plant Sciences Institute Innovations Development Facility (IDF): 4 (all university-related or affiliated)
- i. Number of new companies in research parks and incubators: ISU Research Park: 4 private, 1 university-related & 4 affiliates; Plant Sciences Institute IDF: 1 (university-affiliated)
- j. Number of employees in companies in research parks and incubators: ISU Research Park: 618 private and 221 university-related; Plant Sciences Institute IDF: 7 FTE (all university-related or affiliated)
- k. Royalties and license fee income: \$11.3 million
- l. Total sponsored funding received: \$342.3 million of which \$197.4 million is for research
- m. Corporate sponsored funding received for research and economic development, in total and in Iowa: \$24.9 million total, \$12 million in Iowa
- n. Iowa special appropriations for economic development in the following categories:
 - Annual state appropriations for ongoing programs (such as research parks, SBDC, IPRT, IDM, Metal Casting Center): \$2.5 million—includes \$894,929 SBDC (includes state-wide programs), \$130,010 ISU Research Park & \$1,451,043 IPRT
 - Grow Iowa Values Fund appropriations: \$1,459,200
- o. Research expenditures (including state appropriations and external funding) \$250.1 million—Note that this is an FY10 number, most recent number available
- p. Licenses and options executed per \$10 million research expenditures: 4 (est.)—Note that this is an FY10 figure, most recent number available
- q. Sales of licensed products by Iowa-based companies: See d. above
- r. Number of employees for current Research Park tenants and incubator, as well as former tenants that are still in existence in basic form world-wide 2,993

3. Please describe the ways in which your institution is engaged in the following activities (For example, what is the nature of the outreach and service activities? Which units provide it? What kinds of people and organizations benefit?)

- A. Direct and hands-on technical assistance to businesses and entrepreneurs
- B. Direct economic development assistance to Iowa communities
- C. Economic development services provided by research parks, incubators or similar service units

3A. Direct and Hands-on Technical Assistance to Businesses and Entrepreneurs: ISU System for Innovation

Iowa State University is charged with advancing economic development and technology transfer activities that promote growth and benefit all citizens. While creation of knowledge remains the basic responsibility of a research university, the way we share knowledge determines our success. ISU shares knowledge and expertise with students (learning and teaching), communities (engagement), and business and industry (technology transfer and economic development). ISU ranks as one of the most successful universities nationwide in several categories of technology transfer and economic development. The activities of the colleges, institutes and centers are coordinated through the Research and Economic Development Council that advises the Vice President for Research and Economic Development. The Vice President and this Council continuously communicate with economic development entities within the State such as the Iowa Department of Economic Development, the Iowa Innovation Council, the Iowa Business Council, the Greater Des Moines Partnership, the Ames Economic Development Commission and other local and regional agencies.

The Iowa State University “System for Innovation” was developed to focus on the transfer of university technologies into commercial applications in start-up or existing companies. Functions of the ISU System for Innovation include:

- **Business Development & Assistance and Entrepreneurial Activities:** Efforts related to start-up companies, including business assistance services & SBIR/STTR applications.
 - **Technical Assistance & Technology Development:** Solving technical problems, assisting in product development and process improvement projects for existing businesses. This includes the current efforts of no-cost technical assistance and cost-sharing projects.
 - **Industry Relations:** Facilitation of a multitude of interactions between ISU and its industry partners, including the management of research relationships and interactions with economic development groups, legislative groups, and other third parties.
 - **Community Development:** To disseminate and develop programming, facilitating community organizations, fostering community planning, and coordinating with community and regional economic development networks and organizations.
 - **Technology Transfer and Licensing:** The transfer of intellectual property (patentable inventions, copyright works and proprietary materials) to business and industry through license agreements.
 - **Physical Space:** Physical space for business incubation is available in the ISU Research Park, the Plant Sciences Institute, and the Center for Crops Utilization Research.
 - **Research and Instrumentation Facilities:** Iowa State University maintains more than 20 central research facilities that also serve communities and businesses on a fee-for-service basis.
- Senior capstone design projects are the culmination of engineering education for undergraduate students. Iowa companies, through a partnership between CIRAS and the College of Engineering, provide students the opportunity to apply their

engineering knowledge to real-world applications as a final step in preparation for joining the workforce.

As Iowa experienced the second highest net out-migration of young, single, and college educated residents (only behind North Dakota) from 1995 to 2000, this program has a further goal of slowing the Iowa brain drain. Students are able to obtain a better understanding of job opportunities within the state and businesses discover the value of making an investment in their workforce by providing higher level, higher wage jobs.

By working with the students, companies gain a new perspective on difficult engineering problems with many achieving innovative solutions that enhance productivity and lower costs. Companies have a heightened understanding of the value engineers bring to an organization and are able to showcase their company to students nearing graduation.

In addition to the senior capstone design projects, engineering students have worked with companies on projects related to cellular lean, materials, and facility planning.

In FY11, students worked on 33 projects with 22 different companies. Companies reported impact of nearly \$10 million for these projects.

3B. *Direct Economic Development Assistance to Iowa Communities*

- In FY11, CIRAS was awarded a 3-year grant under the Economic Development Administration (EDA) University Center program to develop and implement the Sustainable Economies Program in the state of Iowa. This program provides Regional Trade Centers (RTCs) in rural Iowa with an in-depth economic assessment of the financial, social, and environmental “triple bottom line” well-being of the region coupled with technical assistance to the critical organizations and businesses of the region.

The program provides sustainability assessments, technical assistance, and mentoring within the communities and businesses that drive the regional economy. During the first year of the program, CIRAS staff, Extension Community and Economic Development staff, and College of Agriculture and Life Sciences economists researched, developed and launched a pilot implementation in the region of Carroll, IA.

Through the Sustainable Economies Program, applied research is ongoing in business and economic sustainability, employee wellness and supply chain sustainability.

3C. *ISU's Key Units Engaged in Economic Development*

Iowa State University, as part of the higher education system in the State, is charged with advancing technology transfer and economic development activities that promote

growth and benefit all citizens. The University evolves these goals by contributing to workforce development, creating intellectual property, advancing ideas to the stage of market readiness, supporting creation of new companies, offering assistance to existing companies, and attracting new companies to the State. The University's economic development/technology transfer support system includes the following units that are coordinated through the Research and Economic Development Council:

- **Pappajohn Center for Entrepreneurship and the Small Business Development Center at ISU (SBDC).** These units work with researchers to define the technologists' role in the company, evaluate markets, assist in the creation of a business plan and help the company develop connections with a network of business resources including consultants, accountants, attorneys, prospective employees and investors. In a typical year, the Pappajohn Center, working with IPRT, the Plant Sciences Institute, ISURF/OIPTT and other research centers, identifies approximately 25 prospective new technologies. These technologies can take six to 26 months to develop sufficiently to justify the formation of businesses. During this time the researcher receives assistance from, among others, the Small Business Development Center at ISU in moving the technology from the researcher's bench to the marketplace. The Pappajohn Center helps the researcher develop the model for the business and establish the network of resources necessary to implement the plan. These resources can include business assistance, students or capital. The Pappajohn Center/SBDC also continues to provide a referral network and facilitates the recruitment of students including access to internships.
- **Institute for Physical Research and Technology (IPRT).** Through IPRT's Company Assistance Program, Iowa companies can leverage the expertise of the IPRT research centers and other ISU capabilities in order to solve technical problems, create new products and processes, and increase productivity and quality. IPRT Company Assistance provides help through both its Research and Development cost-sharing program and through short-term, no-cost technical assistance. IPRT actively collaborates with Iowa companies on technology development projects. Many successful businesses have emerged from IPRT technologies, including Mechdyne of Marshalltown, BodyViz of Ames and PowerFilm, Inc. of Ames.

The staff members of the Materials Group and the Nondestructive Evaluation Group within Company Assistance provide significant and broad expertise to help Iowa manufacturers address material and inspection issues. These programs offer state of the art knowledge to business, and both groups have expanded their capabilities and facilities to keep pace with research advances and modern industrial needs. This direction allows them to interact with various industrial clients and tackle an increasingly wide range of challenges.

- **Iowa State University Research Park.** The Iowa State University Research Park is a 230-acre development with over 325,000 square feet of building space and is located south of the Iowa State University campus. The ISU Research Park is more than just land and buildings; it is a technology community that encourages commercialization of University research.

- **Extension and Outreach Center for Industrial Research and Service (CIRAS).** CIRAS provides applied research, education, and technical assistance to Iowa industry through partnerships with Iowa's universities and community colleges, government agencies, and business associations. Account managers throughout the state meet with clients to assess needs and provide links to resources that companies can use to increase their competitiveness. Solutions are offered through a combination of direct assistance from center staff, university faculty, partner organizations, and outside consultants.

CIRAS staff has expertise in engineering, biobased products and biorenewables, energy systems, management practices, government contracting, productivity, growth services, supply chains, quality systems, and community-business economic development. Service to industry includes technical assistance in conjunction with ISU College of Engineering labs, regional economic development studies to better understand rural economies, engineering workshops for utilities, county and city engineers, educational workshops and mentoring for small to medium sized businesses.

CIRAS manages the statewide National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (MEP), a program of the Department of Commerce. The MEP mission is to act as a strategic advisor to promote business growth and connect manufacturers to public and private resources essential for increased competitiveness and profitability. The objective of the program is to enhance productivity, technological performance, and strengthen the global competitiveness of small-medium sized manufacturers. CIRAS provides companies with the training, tools, and connections to accelerate innovation, leading to new opportunities in domestic and export markets.

The USDA BioPreferred program, enacted as part of the 2002 and 2007 Farm bills, has a goal of increasing the purchase of biobased products by the federal government. CIRAS has helped USDA build this program since its inception in 2002. CIRAS staff manages implementation of the program by gathering industry input, developing government focused marketing strategies, testing biobased content, and facilitating participation in the program. Staff educates public and private stakeholders, manages the biobased product certification and labeling program, and assists with the development of programmatic infrastructure and policy.

The Defense Logistics Agency, on behalf of the Department of Defense, administers the Procurement Technical Assistance Program (PTAP). The purpose of the program is to generate employment and to improve the general economy by assisting business firms in obtaining and performing under federal, state, and local government contracts. CIRAS is responsible for this program in the state of Iowa. Staff helps businesses determine if they are suitable for government contracting, provides workshop training and outreach events, assists businesses with capturing government sales, and provides post award contract assistance.

CIRAS manages the Economic Development Administration (EDA) University Center Program in Iowa. The EDA's mission is to lead the federal economic

development agenda by promoting innovation and competitiveness, preparing American regions for growth and success in the worldwide economy. In FY2011, CIRAS was awarded a 3-year grant to develop and implement the Sustainable Economies Program. This program integrates detailed economic studies with financial, social, and environmental technical assistance to communities and businesses in rural trade centers across Iowa. This integrated, scientific-based approach to sustainability and the triple-bottom line helps the businesses, communities, and overall regional economy begin the process of reliable, long-term growth.

- **ISU Research Foundation (ISURF) and the Office of Intellectual Property and Technology Transfer (OIPTT).** ISURF owns and ISURF and OIPTT jointly manage, market and license the intellectual property for Iowa State University. ISURF/OIPTT works with faculty members in regard to the reporting and protection of innovations, including patenting inventions. It markets the innovations to find commercial partners interested in licensing. It also funds projects within the University that have potential for broadening the intellectual property protection or providing value for its commercial potential. ISURF also provides assistance to Iowa companies, including ISU faculty start-ups with SBIR and STTR applications.
- **Innovations Development Facility (IDF).** This is a business incubator operated by the Plant Sciences Institute to promote the commercialization of plant biotechnology. IDF encourages ISU faculty, staff, and students to commercialize their research in the plant sciences and promotes the development of start-up companies among aspiring entrepreneurs. IDF is housed in the Roy J. Carver Co-Laboratory and consists of six well-equipped laboratory modules. The facility offers an environment to transition research from a university to a business setting. The IDF facility is a productive research location where scientists from academe and industry can work together to advance the mission of the Plant Sciences Institute and to promote economic development in Iowa.
- **Extension to Communities and Economic Development (CED)**

Iowa's Living Roadways Community Visioning Program

For 15 years, the Community Visioning Program has helped rural communities plan transportation enhancements using state funds from the Iowa DOT. To-date, 180 Iowa towns have completed the process and collaborated with design teams to create conceptual transportation enhancement plans. Documented impacts of the program since 1996 include:

- Ninety-four percent of participating communities complete at least one project.
- Internet research of state funding shows that to date, 124 visioning communities received funding from five state programs to do 285 projects. Seventy-seven percent of the projects were directly related to visioning concept plans and 27% were not directly related to the program.
- More than \$16.9 million in state funds was awarded to visioning projects and \$12.4 million to non-visioning projects for a total of nearly \$30 million.
- Estimated cash matches from awardees exceed \$12.6 million for an estimated \$42 million generated.

West Liberty Economic Area Development (WE-LEAD)

WE-LEAD is a non-profit 501(c)(3) corporation organized in 2006 to create, develop, and maintain strong business relationships, and to establish a climate in which new and existing businesses can flourish. As part of this initiative, the City of West Liberty (75%) and ISU Extension Community and Economic Development (CED) (25%) jointly hired a community development specialist. In 2010, WE-LEAD worked with 173 clients, including shareholders, entrepreneurs, local leaders and elected officials, community residents, and students. In 2010 WE-LEAD assisted with 11 business plans, five of which were completed, and added more than 35 jobs in West Liberty. Leadership West Liberty is a community-focused leadership program designed to grow the next generation of leaders in West Liberty. Twenty-nine students have graduated from the four-year-old program. Completion of a community project is a requirement and more than 15 projects have been completed. Keokuk and Jones County are considering the WE-LEAD model. Extension CED is in the process of negotiating a similar contract with the City of Keokuk.

Tourism

ISU Extension CED specialist Diane Van Wyngarden, Ph.D. developed a model travel program for Iowa and marketed it to a national audience through Road Scholar. Current programs include: Exploring Uncommon Communities: a Touch of History, a Taste of Utopia; Upper Mississippi River Reflections: Historic Towns, Trails and Tales; and Missouri River Reflections: a Ribbon of Legends through Four States. Nationally, the Road Scholar program has suffered due to the recession, with roughly half of its scheduled programs canceled. None of ISU Extension's programs have been canceled, and most were sold out with waiting lists. In 2010:

- 229 people from 42 states and two foreign countries participated in the Road Scholar Program. Tuition is \$1,000 to \$1,500 per participant.
- The program has affected more than 100 businesses, and the estimated dollar value of those impacts is \$288,915. The program is self-supported, and the money generated goes directly to travel-related businesses along tour routes.

Sustainability

The ISU Extension and Outreach began a "green initiative" in 23 counties four years ago and has been working with Fairfield on sustainable living and energy-efficient technology. Part of an Iowa Power Fund partially funded a sustainability specialist position shared between ISU Extension and Outreach and the City of Fairfield. The sustainability specialist serves the 9,200 Fairfield residents, as well as southeast Iowa and the state, facilitating community sustainability programs initiated by businesses, industry, and other organizations.

- For example, Fairfield's Green Commission set goals to process 75% more recyclables with a corresponding 25% decrease in waste going to landfills by December 2012.
- After two months of the new program, recyclables increase 67% from the previous monthly average, and in December 2010 the increase in recyclables was 132%. This spring the contract with Fairfield was extended five years.

Extension CED has been approached by the State of Iowa to expand this program.

Local and Regional Housing Trust Funds

The Iowa Finance Authority (IFA) administers a state housing trust fund offering forgivable loans to rehabilitate existing housing; however, many Iowa communities do not have the structure in place to apply for and administer such loans. Through an agreement with IFA, ISU Extension CED is helping communities, counties and regions develop local housing trust funds (LHTF), with which they can apply for seed money from the state to use for affordable housing.

Existing housing trust funds cover 52% of Iowa's population. Primary clientele include counties and regional COGs. Extension CED has incorporated the LHTF development format into regional housing trust fund development. The following regions applied for certification on October 1:

- Region 6 Housing Trust Fund, Inc.—Hardin, Tama, Marshall and Poweshiek Counties
- Northeast Iowa Regional Housing Trust Fund—Allamakee, Clayton, Howard and Winneshiek Counties
- Northwest Iowa Regional Housing Trust Fund, Inc.—Emmet, Lyon, O'Brien, Osceola and Sioux Counties

Lake Delhi Alternative Futures

In summer 2010, the Delhi Dam on the Maquoketa River collapsed under pressure from rising floodwaters. The breach drained a nine-mile lake behind and dam and the resulting flash flood destroyed 16 homes, caused damage to more than 70 others, and released tons of accumulated sediment downstream. In response, the Governor created the Lake Delhi Recover and Rebuild Task Force to develop strategies to assist in the recovery and rebuilding of the area. With ISU Extension Community and Economic Development, the community design studio in the ISU landscape architecture program presented a plan to IDED to collect public input, conduct community and economic analyses of the area, and create scenarios for future development of the Lake Delhi area. The class presented three development scenarios for the area and a final report was presented to the state task force in December 2010.

- **Extension to Families**

Horizons

Thirty-six Iowa communities with populations under 5,000 and poverty rates over 10% trained 301 local facilitators to lead 1,538 community members in a discussion, "Thriving Communities – working together to move from poverty to prosperity for all" discussion.

- 29 communities addressed food insecurity,
- Dunlap's food pantry served 300 people in 2010.
- Eleven Volunteer Income Tax Assistance (VITA) sites completed over 500 returns without charge and claimed over \$250,000 in Earned Income Tax Assistance to eligible families.

- Twelve communities prepared 434 youth for academic success with mentoring, tutoring or early learning programs. Elma built an early learning center which now serves 70 children.
- Ten communities engaged entrepreneurs to increase family income.
- 105 local trained volunteers taught leadership skills to 923 participants. Some became mayors, city council members or provided leadership to local boards, commissions, clubs and organizations thus building stronger communities and families.
- 8,829 community residents shared their thoughts as part of a local visioning process leading to a local action plan to help reduce the local effects of poverty.

Community Volunteers Help Reduce Poverty and Return Dollars to Economy

The Earned Income Tax Credit (EITC) augments the wages of low- and moderate-income workers and, in turn, this flow of income makes a substantial economic impact in local communities. EITC recipients circulate their refunds through the local economy, creating a ripple effect many times the size of the original refund. This money strengthens neighborhoods, assists small businesses, and spurs local economic development. ISU Extension worked with community partners to recruit and train 84 volunteers to provide free tax preparation services to low- and moderate-income families through the Volunteer Income Tax Assistance (VITA) program. In 2011, VITA volunteers working at 37 VITA sites helped 1,875 low- and moderate-income Iowans complete income tax returns. Special efforts were made to increase awareness of the EITC and VITA in rural Iowa. Nine of the VITA sites were established in underserved rural communities that are part of the Horizons project, a Families Extension initiative to reduce poverty and build assets. Twenty Horizons communities conducted EITC awareness campaigns to inform eligible residents about this refundable tax credit. 601 of the filers who qualified for the Earned Income Tax Credit (EITC) received \$816,635 in the 42 counties that participated in the Extension-community partnerships to expand VITA programs in rural Iowa.

Early Childhood Programs

Iowa currently ranks 2nd in the nation for the percentage of young children with all parents in the household employed. An estimated 75 percent of Iowa's children under six-years of age need early care and education while their parents work. The 2009 Iowa Early Care and Education workforce study, found that only 7% of child care center assistant teachers and only 34% of teachers had a bachelor's degree in early childhood or related field. A turnover rate of 31% for assistant teachers and 14% for teachers coupled with low education levels, meant that many of Iowa's children were constantly in the care of a poorly educated, constantly changing workforce. The Better Kid Care New Staff Orientation program has been adopted by Iowa as a key component for stabilizing workforce turnover and providing a basic level of knowledge for new early childhood teachers and assistant teachers who may have limited education and experience. This outstanding program provides new teachers with 30-lessons over a four month period. Teachers view DVD demonstrations, practice and fulfill on-site activities and complete workbook lessons, which are sent into Iowa State University for review. Currently 733 centers and preschools (53% of Iowa licensed programs) participate in the Better Kid

Care New Staff Orientation (NSO) program. As a result of participating in NSO program, 620 new child care teachers have completed a total of 18,600 training hours and report making significant gains in knowledge and program improvements. Ninety-one child care center directors participating in the program report made significant improvements in their skills for effective supervision and support of new early childhood teachers.

- **Agriculture and Natural Resources Extension**

Drainage Professionals

Faculty and staff in ISU Extension to Agriculture and Natural Resources (ANR) provide educational leadership to drainage contractors in Iowa through annually hosting the three-day Iowa Drainage School. In 2010, 40 participants attended the drainage school. Post-meeting evaluations indicated that 75% of respondents indicated the program would help them increase revenues with their work with dollar values ranging from \$50,000 to \$250,000 or up to \$150/acre.

Co-Products from the Ethanol Industry

Co-products of the ethanol fermentation process can be cost effective feeds but have unique characteristics and present challenges in handling storage and delivery. A comprehensive, integrated research and educational program is ongoing. Activities included cattle feeding research, feeding and long term storage demonstrations, workshops, meetings, software development, factsheets newsletters and consultations. In 2007 alone, 67 meetings were held for producers and consultants on the topic. In 2011, participants in educational programs were surveyed on changes in their knowledge, behavior and cost outcomes as a result of educational activities conducted by ISU Extension on ethanol co-product feeding for beef cattle during the period 2006-2010.

- Of those surveyed, 69% had received information or attended an educational event during that time period.
- Of those that had obtained information on this topic from ISU Extension, 88% indicated that the information improved their knowledge of effective ways to incorporate these feeds into the diets of cattle.
- During that time period, 57% of those surveyed increased the usage of ethanol co-products in cattle diets.
- Of those surveyed 91% reported either improved cattle performance or reduced costs of at least 10% as a result of the information received. Of that group, 27% reported a 10% or more reduction in feed costs without decreasing animal performance, 19% reported a 10% or greater improvement in animal performance, and 45% reported both a 10% improvement in animal performance and a 10% decrease in cost of production.
- With today's costs, a 10% reduction in feed costs has a value per animal fed of over \$60. With over 2 million head of cattle fed annually this represents a significant contribution to this growing sector of the Iowa agricultural economy and their local communities.

Financial Decision Making

Beginning farmers often lack access to credit at reasonable rates and terms, to use for purchasing operating inputs and financing purchases of land, livestock, and equipment. To be eligible for financing from the Farm Service Agency, beginning farmers must show knowledge of sound financial management principles by completing an approved course in farm financial management. ISU Extension developed an Internet-based home study course titled Financial Decision Making that allows borrowers to meet this requirement. The course consists of modules covering topics such as developing financial statements to financing long-term assets. Enrollees must satisfactorily complete on-line quizzes and homework assignments.

- As of August 21, 2011, a total of 345 FSA loan applicants have completed the Financial Decision Making course.
- In January 2011 graduates of the course were asked to estimate their annual gross farm income and farm net worth before and after completing it. The average change reported was an increase of \$247,101 in annual gross farm income and \$381,458 in net worth.
- Based on data from the Iowa Farm Business Association, the average net farm income as a percent of gross income during the years that enrollees completed the course was 25%, and the average return on net worth was 9.8%. Applying these rates to the average increases reported results in an estimated increase in annual net income per operator of \$38,182 per operator, or over \$13 million annually for all the families who have completed the course.

These dollars will be reinvested in the state economy and keep more young farmers employed in Iowa agriculture.

Community Vitality Center

The Community Vitality Center (CVC) is a statewide catalyst for identifying and demonstrating new strategies for improving the economic vitality of Iowa's communities and rural areas. CVC received the 2010 Iowa Venture Distinguished Leadership Award from the Iowa Area Development Group for the creation of Iowa MicroLoan and other entrepreneurial and philanthropy development activities. Iowa MicroLoan was founded in 2008 as an independent 501(c)(3) foundation by the Community Vitality Center (CVC) to serve as a statewide microfinance. Since then, Iowa Microloan has received more than \$3.5 million in grants and loan capital as an intermediary for the SBA MicroLoan Program and USDA Rural Micro-Entrepreneur Assistance Program (RMAP). Iowa MicroLoan provides a business plan "second look" and technical assistance for entrepreneurs who have been denied credit from conventional lenders.

- During 2010, IFMCV had loans outstanding to 26 businesses.
- Seventeen of the businesses were startups.
- Fourteen of the businesses were from rural counties (54%) and 12 were from metro counties (46%).
- Of the total co-signors and guarantors involved, 56% were women and 44% were men, 5% were minority, and 5% were people with disabilities.
- Of the total, 15% were below the HHS poverty level, 29% were below HHS 150% poverty level, and 46% were below the HUD low income level.

During 2010, CVC assisted IDEED and Iowa Microloan in implementing the Iowa Small Business (ISB) Loan Program approved by the Iowa General Assembly and signed by the Governor in 2010. CVC provided input for the Administrative Rules, facilitated loan application and underwriting process subcontract between IDEED and Iowa MicroLoan, facilitated coordination of the ISB Loan Program among IDEED, Iowa MicroLoan and Iowa Small Business Development Centers, and conducted an evaluation of the program.

- During the eight months in operation from August 1, 2010 to March 31, 2011, the ISB Loan Program provided loans to 42 businesses that created or retained 130 direct jobs and generated \$3,423,837 in new business financing investment by leveraging \$1,639,889 in direct loans with \$1,783,948 in co-financing by local financial institutions.
- As a result, it is estimated that 228 total direct, indirect and induced jobs were created and/or retained by the implementation of the Iowa Small Business (ISB) Loan Program.
- Twelve of the applications approved were for startup businesses. Applications were received from 29 of Iowa's 99 counties with 30 applications from enterprises located in rural counties and 24 from metro counties. Two of the companies receiving ISB Loans have more recently been highlighted in separate features by the Des Moines Register for innovations in their respective industries.
- CVC and Iowa MicroLoan's involvement and performance in the ISB Loan Program led to participation in IDEED's recently approved application for \$13.1 million from the State Small Business Credit Initiative (SSBCI) program of the U.S. Treasury Department in which \$3.2 million is allocated for continuation of the ISB program.

The Office of the Vice President for Research and Economic Development (OVPR/ED) works closely with all of the above units, including the Office of the Vice President for Extension and Outreach, in promoting the University's mission related to technology transfer and economic development.

- The Research and Economic Development Council (chaired by the VPR/ED) coordinates ISU research, technology transfer and economic development activities. Members meet periodically to discuss problems, update each other on activities, assess the state and national environment for technology transfer, and propose policy and procedures to encourage technology transfer and economic development activities at ISU. This council, formed in 1993, is comprised of representatives from all units on campus that have a primary role in economic development and technology transfer as well as representatives from each of the seven colleges.
- The recently initiated comprehensive management strategy for key industrial partners is continuing to show results. This effort is co-led by the Industry Relations Team and the Corporate and Foundations Relations group in the ISU Foundation. The goal is to develop ten strategic partners during the period FY11 – FY16. Based on the established metrics, we are half way toward achieving that goal.

The above units are the key units that focus attention on economic development and technology transfer at ISU; however, significant additional related activity also occurs across campus in individual academic departments, centers and institutes, and colleges.

4. Please briefly describe two or three examples of major economic development collaborative projects with such other entities as Regent universities, Iowa community colleges, the Iowa Department of Economic Development, Iowa Workforce Development, or other state agencies.

Major Economic Development Collaborative Projects

NSF EPSCoR. ISU collaborated with UNI and the U of I on an NSF EPSCoR proposal that received funding (\$20 M) in September 2011. The grant will develop a statewide energy plan for the State of Iowa, covering two renewable energy platforms--wind and bioenergy--and a third platform dealing with energy efficiency. The ultimate outcome will be an energy plan leading to energy efficiency and sustainability for the State. Other partners include the Iowa Economic Development Authority, the Iowa Energy Center, community colleges and other four-year institutions in Iowa, and industry.

Grow Iowa Values Fund. This legislation is providing the universities and private colleges financial resources to expand technology transfer and commercialization efforts. We are in the seventh year of GIVF funding, in addition to providing core support for infrastructure in the Research Park, Pappajohn Center and the VPR/ED office. Each year projects are funded that pair ISU researchers and Iowa companies. More information appears later in this report.

Innovate Iowa Proof of Concept Initiatives. Iowa State is establishing an initiative that will focus on increasing the transfer of technology while reducing the time required to commercialize it. Technology and business development will occur in parallel by engaging staff from the ISU Research Foundation, the ISU Research Park, the Pappajohn Center for Entrepreneurship and technology experts. This initiative will provide a single, visible interface for faculty, staff and students seeking opportunities and provide simplified, coordinated communication.

A reinvigorated process for prospect development and start-up company acceleration. The ISU Research Foundation, the ISU Research Park and the Pappajohn Center for Entrepreneurship are engaged in a strategic partnership to reinvigorate our approach to engaging students, staff and faculty in entrepreneurial start-up activities. Information about this new process will be available in early 2012.

State-wide committees – Many people from ISU serve on committees that promote economic development programs such as the Iowa Innovation Council, the Biosciences Alliance of Iowa, the Iowa Innovation Council's Iowa Advanced Manufacturing Committee, Iowa Meat Processors Association, Institute of Food Technologists-Iowa Section, the Iowa Lean Consortium, the Partnership for Industrial Energy Efficiency, Professional Developers of Iowa, the Iowa Business Council, the Iowa Alliance for Wind Innovation and Novel Development (IAWIND), Innovate Iowa!, etc.

5. Please provide the following information about Grow Iowa Values Fund projects for FY 2010:

A. Identify and briefly describe each project or initiative which received GIVF funding in FY 2011 including information on outcomes or progress made

B. Identify metrics which were used to measure outcomes for each project and report progress on each metric for FY 2011

C. Provide a description of the sources of the matching institutional dollars for each GIVF-funded project

The ISU Grow Iowa Values Fund (GIVF) program has a competitive research component that pairs ISU faculty members with Iowa industries to create economic benefit for the companies. See **Appendix 1 and Appendix 2** for complete report.

6. Optional: If desired, please include observations regarding:

A. Availability of startup and venture capital for technology entrepreneurs

B. Suggestions for new programs or activities that could further enhance the impact of university technology transfer and service on creation of jobs and wealth in Iowa.

6A. Iowa continues to suffer from a lack of investment capital for start up and rapidly growing technology/innovation based firms.

- The Values Funds to the universities have provided a valuable source of funding for proof of concept/early stage development funding for the innovations that will become the next generation of businesses.
- There has been an increase in the number of Angel/Seed funds throughout the state. Available capital and experience varies widely and there is little coordination between the funds. The seed funds have typically brought more individual investors into play.
- The funding provided by Wellmark through the Pappajohn Center's has been a very valuable tool for early stage investment.
- There are very few true venture capital firms located in the state of Iowa actively investing funds at this point in time. Iowa continues to suffer from a lack of investment capital for start up and rapidly growing technology/innovation based firms.
- Each fund has a particular focus, the investment profile further limiting choices and resulting in very little competition.
- Most venture firms invest with other venture firms, one as lead with the others in secondary positions to spread risk and assure the ability to continue to fund the needs of the company--this is a major problem in Iowa.
- Firms must look outside the state for significant investments of \$5 million plus.

- Really good businesses with really good management teams will attract money; a major problem is the development of an experienced/skilled management team.

6B. Restoration of funds for economic development and technology transfer activities due to budget cuts in the past several years would greatly enhance the University's efforts in this area. The following is a summary of what benefits would occur if funds were restored in the units affected by budget cuts.

- **Small Business Development Centers.** The legislature cut a total of \$16,373 from the SBDC budget for FY09 and another \$99,436 for FY10. In FY10 the state appropriation after the 10% reduction was \$894,930. In FY11, the legislature appropriated an additional \$100,000 restricted solely to business counseling and for no other purpose, raising the total line item appropriation for FY11 to \$994,930. The FY12 state line item appropriation was reduced to \$936,345. In addition, the \$266,000 the program received from the Grow Iowa Values Fund in FY11, all of which was distributed to the service centers, was reduced to \$105,000. Total state resource dollars directed to the program for FY12 is \$1,041,345, down from \$1,260,929 in FY09. In addition, pursuant to census changes, the program's allocation of federal funds is reduced by \$34,063 for FY12. The total reduction in funding for FY12 over FY11 is \$195,063.

As demonstrated by an independent study, for every Iowa tax dollar spent on the Small Business Development Center program, \$2.47 is generated in increased tax collections the following year from SBDC counseling services alone. The majority of any restored and new funds would be directed toward client counseling, resulting in an increase in tax revenues over tax expenditures.

State budget cuts for FY12 have been addressed by forcing austerity budgets on the program's service centers and requiring them to divert program funds from other uses. These budgets are too lean to allow for adequate services. Thus, if state funding is not restored to at least FY09 levels, including \$350,000 originally allocated to the program through Grow Iowa Values Funds, multiple service centers will have to be closed, thereby diminishing the net beneficial impact of the program.

- **Iowa State University Research Park.** The restoration of approximately \$230,000 in funding to the Iowa State University Research Park would provide direct benefit to Iowa State University efforts to establish and support new technology ventures. New funds would be utilized to support the costs of providing incubator space and the support services required by new and early stage companies. The additional funds will increase the capacity for business incubation resulting in more new companies created and higher quality support for the young companies.
- **Center for Industrial Research and Service.** CIRAS has successfully leveraged its state budget to bring in additional federal grants and fees to expand technical assistance, education programs and economic development studies to support Iowa businesses. In FY11, CIRAS helped generate an additional \$2.70 for each \$1 of state funds provided. Of the approximately \$4.5 million of additional funding generated, more than \$1.2 million was distributed to other

business outreach units on campus to help them expand their work with Iowa companies.

CIRAS has lost over \$1.6 million of funds (in 2011\$) from their annual budget in the past decade. This includes state appropriations and matching funds provided by the Iowa Department of Economic Development. These funds were used as match on the Department of Commerce/NIST Manufacturing Extension Partnership award and the Department of Defense Procurement Technical Assistance Program award. This loss of state funds reduces the extent of CIRAS assistance to companies and communities and limits the amount of additional funds that might be brought to Iowa via new business assistance grants.

The loss of annual funding from state appropriations and agencies equates to a reduction of approximately 13 full time staff - includes salary and fringe benefits, and associated expenses. This can cause a further reduction of roughly 13 staff due to a loss of federal awards requiring matching funds from the state. Based on an analysis of data provided by Iowa companies, these 26 staff positions might have generated nearly \$60 million of impact and more than 700 jobs in Iowa companies — each year.

Using this same data, for every \$100,000 of additional state funds that are made available, CIRAS would be able to leverage the funds to bring in an additional \$150,000 from grants and fees and hire two new business professionals to provide services in the areas of engineering, biobased products and biorenewables, energy systems, management practices, government contracting, productivity, growth services, supply chains, quality systems, and community-business economic development. These two staff would help create nearly 50 jobs and \$5,000,000 of new sales, cost savings, and investment impact in Iowa companies.

- **Institute for Physical Research and Technology (IPRT).** The IPRT economic development programs suffered losses of over \$500,000 over the past three years. These losses follow \$2,500,000 in budget cuts in 2003, which were never restored. Ironically, these cuts came at times when the need for IPRT's expertise by Iowa industries was rapidly growing. Although pieces of the program have survived the cuts, it now serves only a fraction of the Iowa companies it once served and the current personnel are overextended. Companies seeking help outside the core competencies of the IPRT Company Assistance staff cannot be assisted. In the past these potential clients were guided to working with faculty members via subsidized projects. Because of the budget cuts, IPRT has restricted the technical assistance it provides to Iowa companies to those services that fall within the core competencies of IPRT staff rather than pursuing these collaborative, cross-disciplinary projects. Also, fewer R&D cost-share projects that can lead to new products are pursued due to the declining funding. Over 75% of the Iowa manufacturers that IPRT serves have less than 100 employees. This means that the typical industrial client will likely not have the needed expertise internally to address their material and inspection issues.

The materials assistance unit of the IPRT economic development program provides short-term no cost technical assistance to Iowa manufacturers and is often the first interaction that manufacturers have with the University.

Restoration of funding would allow for growth of materials assistance, enhancing their delivery of services. They seek to offer a wider scope of services directly meeting the needs of Iowa manufacturers.

The NDE (nondestructive evaluation) unit of this program functions similarly to the materials group, in that short-term technical assistance is provided to Iowa manufacturers on a no-cost basis. The focus of the NDE Group is to assist companies in areas of inspection and quality control. To that end, the NDE Group serves as an unbiased source of information, offering clients a broad range of expertise in various inspection methodologies. Manufacturers often do not have staff acquainted with these capabilities, so the group in effect complements the engineering capabilities of their clients. The group assists client companies in addressing problem areas, ensuring product development and quality. This assistance requires robust budget support to maintain the needed flexibility to successfully address the wide range of industrial concerns that are presented to it.

The technology commercialization unit administers cost-sharing, contract research projects, working with Iowa's small to medium-sized manufacturers. These small companies have very limited Research and Development dollars and facilities, and now, this unit does not have the funds needed to leverage Iowa companies' limited resources. These are projects with obvious economic impact—introduction of new products, addressing manufacturing processes, and improving quality—all areas that impact Iowa's global competitiveness in the manufacturing sector. Before the budget cuts of the last several years, the staff proactively marketed the research and development strengths of ISU's faculty to potential Iowa industry partners. This outreach effort was eliminated due to constraints on staff time and funds available for these projects, which may have had other unintended consequences.

A unique feature of the economic development program in IPRT is the active participation of scientists from internationally renowned ISU centers such as the Center for Nondestructive Evaluation, the Virtual Reality Applications Center and the Center for Catalysis. These centers have excellent track records of spinning off new Iowa start-up companies in the areas in which they excel. Restoring the budget cuts to IPRT units would have a rapid positive impact on Iowa's manufacturing sector. An investment now will result in continuing benefits to Iowa's companies, important opportunities to retain our brightest students, and new start-up companies based on increased technology transfer from IPRT centers.



University of Northern Iowa Annual Economic Development and Technology Transfer Report FY 2011

Section 1. UNI's Economic Development Activities to Enhance Economic Growth in Iowa

The past year proved to be a challenging one for the national economy, as well as here in Iowa. Our state was not insulated from the job loss and slow economic growth impacting the entire country. However, with all challenges come opportunities. The economic conditions helped to demonstrate the true character of our state and of all Iowans: a willingness to buckle down and get done what needs to be done. This same character is reflected in the consistent services provided by UNI's economic development programs. UNI has remained a reliable resource for businesses, communities and entrepreneurs throughout the state; not only continuing services, but in many areas, expanding our impact, despite reduced funding. Outcomes realized by key economic development/tech transfer programs during FY 2011 include:

Overall

- Provided service in all 99 counties to nearly 1,300 unique business, community and local government clients; another 10,000 individuals were engaged in the MyEntre.Net entrepreneurial support system.
- Involved 212 faculty members and more than 2,000 students in the delivery of these services.
- Leveraged each \$1 invested by the state with \$6 in private grants, fees or federal funding.

Entrepreneurship, Business Incubation and Technology Transfer

- UNI's 3 incubator/accelerator programs and MyEntre.Net helped start or expand 247 ventures creating 175 FTE jobs.
- Nearly 10,000 individuals are now actively engaged in the MyEntre.Net online community.
- MyEntre.Net provided on-demand business and market information to 311 businesses through its new Business Concierge service; another 243 clients were served by the UNI SBDC.
- 21 student businesses were tenants in the John Pappajohn Entrepreneurial Center's Student Business Incubator and 43 additional student entrepreneurs were assisted by the affiliate program.
- One of the UNI John Pappajohn Center's student incubator tenants has been selected as a winner of the John Pappajohn Collegiate Business Plan Competition and another tenant was one of five national finalists in *Entrepreneur* magazine's Collegiate Entrepreneur of the Year competition.
- UNI faculty and staff submitted 8 new intellectual property disclosures.
- 3 patents were received and 5 new patents were filed.
- 2 new license agreements were approved and a total of 11 license agreements are currently generating income.



Waste Reduction, Environmental Assistance and the Bioeconomy

- Environmental technical assistance and on-site reviews were provided to 191 small businesses.
- The GeoTREE program worked in conjunction with multiple state and local agencies, using geospatial mapping to identify solutions to specific problems including energy efficiency and watershed management.
- Recycling and reuse project funding was provided to 48 companies and organizations; another 160 individuals were provided testing assistance for products using recycled materials.
- The RRTTC provided education and training on recycling, environmental and health sustainability to students, faculty and Cedar Valley residents.
- Energy and environmental education programming reached 48,110 K-12 students.
- The Tallgrass Prairie Center distributed native prairie seeds to 50 Iowa counties as part of its roadside vegetation project.
- NABL contracted with US Department of Navy to develop biobased lubricant specifications for military use.
- NABL-developed technologies were featured on an episode of The History Channel's *Modern Marvels* television program

Local Economic Development

- IDM worked with Iowa Workforce Development to complete a community guide for dealing with mass layoffs and plant closures.
- Community clients report creating approximately 1,500 jobs as a result of local economic development technical assistance from the Institute for Decision Making (IDM).
- Comprehensive technical assistance was provided to 68 community partners and 4 regional groups.
- Strategic marketing Services completed a new regionally-based existing industry report that illustrated the unique economic impact of major employers in the North Central Iowa region.

Advanced Manufacturing & Market Research

- Continued sponsored research was conducted into biobased foundry binder systems resulting in two new patent submissions and license agreements.
- MCC provided custom technical assistance and outreach services to 6 Iowa foundries.
- Market research and analysis services were provided to 9 Iowa companies and 15 national companies.
- Market research clients report an average employment increase of 14%, due in part to the information provided by UNI.



Section 2. Technology Transfer and Intellectual Property

FY 2011

	UNI
a. Number of disclosures of intellectual property	8
b. Number of patent applications filed	5
c. Number of patents awarded	3
d. Number of license and option agreements executed on institutional intellectual property	2
e. Number of license and option agreements yielding income	11
f. Revenue to Iowa companies as a result of licensed technologies	\$2,400,000
g. Number of start-up companies formed, in total and in Iowa	61/61
h. Number of companies in research parks and incubators	23
i. Number of <u>new</u> companies in research parks and incubators	15
j. Number of employees in companies in research parks and incubators	45
k. Royalties/license fee income	\$99,074
l. Total sponsored funding	\$43,000,000
m. Corporate-sponsored funding for research and economic development and revenue generation (excludes corporate philanthropy - all in Iowa)	\$2,070,500
n. i. Annual appropriations for economic development	\$549,606
ii. Grow Iowa values appropriation	\$729,600

Section 3. Overview of UNI’s Economic Development Programs

UNI outreach services for community and economic development activities are outlined in a table format on the following seven pages. The format provides a brief overview of each program, its purpose, those served and outcomes. Together, the programs served approximately 1,300 unique businesses and organizations in the past year and another 10,000 individuals through the MyEntre.Net entrepreneurial development system.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
Institute for Decision Making (IDM)	Hands-on community and economic development guidance and research	Economic development organizations, chambers of commerce, city councils, communities and others	<ul style="list-style-type: none"> ✓ Completed a new type of existing industry report outlining economic impact of regional employers. ✓ Assistance and research provided to 68 community partners and 4 regional development groups. ✓ Provided assistance to two communities impacted by tornado disasters. ✓ Developed a state-wide guide to dealing with mass layoffs and plant closures. 	<ul style="list-style-type: none"> ✓ Served 641 communities, counties and groups in nearly all of Iowa's counties. ✓ Community clients report 1,500 – 2,000 new jobs annually as a result of IDM assistance. ✓ Trained over 760 economic development professionals.
Iowa Waste Reduction Center (IWRC)	Free, confidential, environmental assistance for small businesses	Small businesses throughout Iowa	<ul style="list-style-type: none"> ✓ Environmental technical assistance and on-site reviews were provided to 191 small businesses. ✓ 387 military painters, supervisors and Department of Defense personnel trained by the STAR4Defense paint training program. 	<ul style="list-style-type: none"> ✓ Provided 5,244 on-site reviews to Iowa small businesses. ✓ 1,740 individuals trained in efficient spray painting techniques through the STAR4Defense program.
National Ag-Based Lubricants (NABL) Center	Biobased lubricants research, testing services, development of performance standards and biobased lubricant product certification	Companies and individuals developing biobased lubricants, traditional lubricant companies, and lubricant consumers	<ul style="list-style-type: none"> ✓ Provided fee-based testing and biolubricant product development services to clients in multiple countries and states. ✓ Contracted with US Department of Navy to develop military-compatible, biobased lubricant specifications ✓ Published text on biolubricant technology: <i>Biobased Lubricants and Greases</i>. 	<ul style="list-style-type: none"> ✓ Over 40 soy lubricants, greases, metalworking fluids and specialty lubricants developed to date. ✓ A national testing and certification center, leading the nation's biobased lubricants industry.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
Strategic Marketing Services (SMS)	Market research and analysis	Businesses, entrepreneurs and non-profit organizations	<ul style="list-style-type: none"> ✓ Market research and analysis services were provided to 9 Iowa companies and 15 national companies. 	<ul style="list-style-type: none"> ✓ Since 1990, market research and analysis services have been provided to 281 Iowa companies.
Executive Development Center (EDC)	Management and professional training workshops and certificate programs	Iowa businesses and organizations	<ul style="list-style-type: none"> ✓ Specialized business management training provided in 66 workshops to 538 business professionals representing 53 businesses. 	<ul style="list-style-type: none"> ✓ Since 1998, has provided training in 1,142 workshops to 19,034 business professionals.
John Pappajohn Entrepreneurial Center (JPEC)	Research, entrepreneurship education, technology transfer, and capital investment programs	Students interested in entrepreneurship, UNI faculty and staff entrepreneurs, new ventures and rapidly growing small companies	<ul style="list-style-type: none"> ✓ One UNI student entrepreneur was selected as one of five finalists for <i>Entrepreneur</i> magazine's student entrepreneur of the year. ✓ UNI Entrepreneurs (student organization) took second place nationally in the environmental sustainability challenge sponsored by Sam's Club. ✓ 21 student business owners were tenants in the student business incubator. ✓ 43 student business owners were provided services as part of the student business affiliate incubator program. 	<ul style="list-style-type: none"> ✓ The JPEC Student Business Incubator has provided space to more than 52 business owners since FY05. ✓ The JPEC has consulted with 192 faculty and staff from colleges and universities from around the U.S. and the world on student business incubation since FY08. ✓ The Cedar Valley Venture Fund, managed by JPEC, has invested in 6 new ventures.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
Iowa Center for Immigrant Leadership and Integration (ICILI)	Helping Iowa communities and businesses accommodate the needs of newcomers	Communities, faith-based organizations and businesses	<ul style="list-style-type: none"> ✓ Created a new handbook entitled <i>New Americans, New Iowans</i>. ✓ Created a manual for effectively using interpreters in health care settings. ✓ Worked with 20 companies, health care providers, social service providers and communities to better meet the needs of newcomers. 	<ul style="list-style-type: none"> ✓ Assistance in accommodating the needs of newcomers has been provided to more than 200 Iowa companies and organizations. ✓ More than 25,000 print copies of 4 different manuals (and countless electronic copies) have been distributed throughout Iowa.
UNI Regional Business Center/ Small Business Development Center (RBC/SBDC)	Rural/ Urban Entrepreneurship development, online entrepreneurship support system, business consulting, business training, business incubation	Small and medium sized businesses, entrepreneurs, entrepreneurial service providers, community leaders	<ul style="list-style-type: none"> ✓ 3,339 new members of MyEntre.Net. ✓ Business Concierge services were provided to 311 businesses. ✓ 2011 MyEntre.Net statewide small business survey results show 183 new or expanded businesses, 174.5 new FTE jobs and \$10,861,381 in new commercial/ equity investment. ✓ Incubation Services engaged 9 new tenants, graduated 1 business and added 20 new employees. ✓ 243 clients served by UNI SBDC with technical assistance, 164 served with classroom training. ✓ 100,000+ visits to MyEntre.Net. 	<ul style="list-style-type: none"> ✓ 9,776 entrepreneurs are engaged online at MyEntre.Net as of June 2011. ✓ EntreFest! traveling conference has hosted 993 attendees from 78 Iowa counties. ✓ MyEntre.Net webinars have been hosted twice monthly since 2003; 153 webinars are archived online.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
Tallgrass Prairie Center (TPC)	Research, techniques, education and source-identified seed for restoration and preservation of native vegetation	Iowa counties, state and federal agencies, commercial native seed producers, the community, educators, students and prairie enthusiasts	<ul style="list-style-type: none"> ✓ Roadside vegetation research for restoring right-of-ways was provided to the Iowa DOT and native seeds were distributed to 50 counties in Iowa. ✓ Continued applied research to determine prairie species mix for optimal biomass electrical generation. ✓ Published by U of I Press <i>Tallgrass Prairie Center's Guide to Prairie Restoration in the Upper Midwest, Tallgrass Prairie Centers Guide to Seed and Seedling Identification.</i> ✓ Hosted 23rd North American Prairie Conference. 	<ul style="list-style-type: none"> ✓ More than 17,000 acres of roadway right-of-way have been restored to native vegetation. ✓ Provided information for Iowa DOT to change seeding regulations. ✓ Demonstration projects on effectiveness of hydroseeding. ✓ Prairie Power Project completes 2nd year. ✓ Three major publications by staff.
Center for Energy and Environmental Education (CEEE)	Technical assistance, educational programs and leadership in energy conservation and renewable energy, environmental conservation and community-based agriculture	Iowa cities, counties, Iowa schools, teachers, farmers, businesses, elected officials, state agencies, community leaders, citizen organizations	<ul style="list-style-type: none"> ✓ Green Iowa AmeriCorps sites weatherized 114 homes in the state. ✓ The CEEE FREE loan program reached 10,072 students, 9,445 adults, and 447 teachers, increasing energy understanding. ✓ Iowa School Energy Challenge engaged 20 secondary schools in energy efficiency. ✓ Buy Fresh, Buy Local participating restaurants and institutional buyers in the Black Hawk County area spent \$2.65 million on locally grown foods. ✓ Iowa Farm Energy Working Group helped reduce fossil fuel use on small to mid-sized farms this year through meetings for 60 farmers/advocates. 	<ul style="list-style-type: none"> ✓ Green Iowa AmeriCorps has weatherized 365 homes, conducted 250 education programs that reached over 17,000 people. 23,000 homes have been provided with energy efficiency advice/improvements and over 7,400 volunteers have been recruited since the program began in 2009. ✓ Since 1998, CEEE's Northern Iowa Food & Farm Partnership has facilitated purchase of \$12.5 million



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
			<ul style="list-style-type: none"> ✓ In 2011, CEEE's waste reduction initiative reached 391 teachers, impacting roughly 7,500 students. 	<p>worth of meat and produce from hundreds of area farmers by food vending institutions.</p>
<p>Recycling and Reuse Technology Transfer Center (RRTTC)</p>	<p>Recycling and by-products research, environmental education and outreach.</p>	<p>Serving Iowa businesses, the recycling industry, University, K-12 schools and Iowa citizens.</p>	<ul style="list-style-type: none"> ✓ Research project funding and outreach services related to recycling and reuse were provided to 48 companies and organizations. ✓ Outreach services provided to more than 10,455 individuals this year, including business/industry, K-12 students and teachers, and Iowa citizens. 	<ul style="list-style-type: none"> ✓ Over 43 RRTTC funded research projects. ✓ Over 170 reports and publications available.
<p>Metal Castings Center (MCC) and Center for Advanced Biobased Foundry Binders (CABB)</p>	<p>Metal casting technologies, applied research, testing and training</p>	<p>Iowa casting users, foundries and foundry suppliers</p>	<ul style="list-style-type: none"> ✓ Maintained active contracts with 24 companies, provided outreach projects to 6 Iowa foundries and technical assistance to 30 additional foundries. ✓ Sponsored research into bio-based foundry binders – 2 patents submitted. ✓ Sponsored commercialization of bio-based foundry binders. ✓ Assisted University of Iowa and Rock Island Arsenal in technology development 	<ul style="list-style-type: none"> ✓ Over 50 industry funded research projects have been completed to date.
<p>Materials Innovation Service (MIS)</p>	<p>Mechanical, physical and chemical tests of metals, polymers and cementitious materials</p>	<p>Serving Iowa manufacturers and suppliers</p>	<ul style="list-style-type: none"> ✓ Technical assistance and testing services provided to more than 160 individuals, primarily for products using recycled materials. ✓ Continued active testing contracts with five companies. 	<ul style="list-style-type: none"> ✓ More than 2,000 hours of testing provided since the beginning of the program.



Section 3. Overview of UNI's Economic Development Programs (continued)

Programs	Services	Those Typically Served	FY 2011 Results	Cumulative Results
Geoinformatics Training, Research, Education and Extension Center (GeoTREE)	Geospatial technologies, education, research, and outreach activities for federal, state, local and tribal agencies	Federal, state, local and tribal (FSLT) government agencies (NASA)	<ul style="list-style-type: none">✓ Worked with Iowa DNR and Iowa Department of Public Health to apply geospatial data for solving problems.✓ Worked with Cedar Falls Utilities on identifying areas most in need of energy conservation and efficiency assistance.✓ Worked with the City of Cedar Falls on watershed management.	<ul style="list-style-type: none">✓ GeoTREE has provided training to over 100 people and collaborated with multiple state and local agencies.



Section 4: Grow Iowa Values Funding Project

See attached spreadsheet highlighting outcomes from UNI's Grow Iowa Values Fund projects in 2011.

Section 5: Collaborative Projects

Entrepreneurship, Business Incubation and Technology Transfer

- **Regional Business Center (RBC), The Iowa Bankers Association, The Technology Association of Iowa, Renew Rural Iowa, Iowa Department of Economic Development, Iowa Area Development Group, the Community Vitality Center and multiple regional economic development groups**

In early FY11, the RBC and collaborative partners launched a statewide contest entitled Dream Big Grow Here, featuring \$1,000 monthly grants awarded online to emerging and existing Iowa small business owners who uploaded their 'dreams,' then encouraged friends, family and other business owners to vote for them. In response to the initial contest's popularity, a regional competition was initiated with additional service provider partners. This statewide team identifies regional economic development groups willing to host a \$5,000 regional Dream Big Grow Here Contest. All regional contest winners will be invited to participate in a statewide pitch-off party hosted via live video streaming this fall for a \$10,000 grand prize judged and awarded by the sponsorship team.

Waste Reduction, Environmental Assistance and the Bioeconomy

- **NABL Center and the U.S. Department of the Navy**
In FY11, the NABL Center began a long-term collaborative project with the US Department of the Navy, to evaluate current standardized testing metrics for biobased lubricants, and to develop appropriate biobased product specifications and testing methodologies which would assure biobased lubricant performance levels. The goal of this collaboration is to provide the US Navy with useful standards and guidelines for adopting biobased products in naval equipment and operations.
- **Metal Casting Center (MCC)- Center for Advanced Biobased Binders (CABB) and multiple Iowa firms**
The CABB program is continuing to refine and develop biobased foundry binders in an effort to replace current petrochemical urethane systems. The CABB program is currently working with several Iowa manufacturers including Deere & Company, ATEK Precision Castings, Clow Valves, Viking Pump Corp and Sivyer Steel castings in efforts to replace current adhesive systems with an environmentally friendly renewable source material. To date the center has developed several new technologies that will positively affect the foundry industry in Iowa.



- **Tallgrass Prairie Center, Cedar Falls Utilities and the Iowa Crop Improvement Association**

The Tallgrass Prairie Center (TPC) continues a relationship with Cedar Falls Utilities (CFU) to determine the maximum energy production potential from prairie biomass. CFU will burn the biomass in their stoker furnace to evaluate the materials. Unfortunately, the June 2008 flood has set the project back one year. Plots were replanted in 2009 and second year biomass data will be collected this fall. Test burn of biomass will be conducted in spring 2012. TPC continues working with the Iowa Crop Improvement Association to develop a consortium of native seed producers, native plant growers, nurseries, Iowa DNR, Iowa DOT, Iowa NRCS and private individuals to market native plants.

Local Economic Development

- **Institute for Decision Making (IDM) and Iowa Workforce Development (IWD)**

In the spring of 2011, IDM and IWD released the guide *Community Response Manual: A Guide to Reacting to Business Downturn*, providing actions and strategies for communities to prepare for, and respond to, mass layoffs and business-closing crises. These partners launched the concept and began pursuing funding for this manual several years ago, and through a recent investment from the U.S. Department of Labor, were able to complete this practical guide. The manual is designed to be a resource for local leaders to respond proactively. Though each local economy is unique, many of the actions and strategies needed in a layoff or crisis situation are similar and this manual attempts to highlight many of those actions and strategies in a practical and useable manner.

Advanced Manufacturing & Market Research

- **Strategic Marketing Services (SMS) and the North Central Iowa Alliance (NCIA)**

SMS partnered with NCIA to determine the amount of excess production capacity existing among a select group of businesses in the geographic region represented by the NCIA. The results of the study will be used to select four companies from those participating in the study for in-depth market research projects to be conducted by Strategic Marketing Services. Based on the responses received by 43 potential participants, SMS recommended eight companies for consideration as potential participants for a marketing research project. Of the eight companies recommended, four accepted the opportunity.

- **Metal Casting Center (MCC), Northern Illinois University, Quad Cities Manufacturing Laboratory and Rock Island Arsenal**

The MCC is currently collaborating with these partners to develop a center for excellence in titanium casting technologies. Projects include the development of advanced technology to replace heavy conventional castings with high-performance titanium castings. The resulting technology will be available to Rock Island Arsenal and also licensable by commercial companies throughout the Midwest.

University of Iowa - as of December 31, 2011

Grow Iowa Values Fund Appropriations

\$1,459,200

Board of Regents approved August 2010

- 1 Support new company formation through University of Iowa Research Foundation
- 2 Support operational and personnel costs of key economic development areas
- 3 Fund expenses at the new BioVentures Building
- 4 Expansion of Center for BioCatalysis and BioProcessing (CBB)
- 5 Integrate and develop economic development support functions
- 6 Support training, consultation and outreach for Iowa entrepreneurs

<u>FY 2011 GIVE</u> <u>Appropriation</u>	<u>Revised 2011</u> <u>Budget</u>
\$300,000	\$427,647
\$265,250	\$339,638
\$246,250	\$246,250
\$150,000	\$126,000
\$331,700	\$148,355
\$166,000	\$171,310
<u>\$1,459,200</u>	<u>\$1,459,200</u>

University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	Support new company formation through University of Iowa Research Foundation	FY 2011 State Appropriations (GIVF)	\$427,647	\$82,685
		FY 2011 Matching Funds (Other)	\$427,647	\$85,000
Description of Project	The University of Iowa Research Foundation (UIRF) will focus on two primary activities. First, continue with its contribution to the integrated model of new company formation. Second, educate faculty in key colleges and departments towards identifying viable technology that has potential to create intellectual property that can be protected and lead to new companies and/or licensing opportunities.			
Anticipated End Results	As these programs are implemented and sustained, we expect the pipeline of promising new ventures to become a robust source of on-going economic development in Iowa. New company formation based on UI or Iowa-related intellectual property involves assessment and exploration, early planning and development, and pre-seed and seed investing.			
Results achieved to Date/Plans	1) Our continued ability to leverage state investments can be directly linked to the creation and growth of 11 existing local startups as of FY11. Over this period, 16 proof of concept projects were vetted, competitively reviewed and ultimately funded. Fourteen of those projects are associated with startup companies, or intended startups, of which, 11 remain viable and are moving forward. Most significant are 5 companies that formed in large part due to potential shown by GIVF funded experiments in the areas of human health, disease models, and battery technology. Two other existing startups were propelled by GIVF funded experiments and have leveraged GIVF with significant federal and/or venture financing or industry funded product development in the area of human health. 2) In FY11, UIRF worked with 122 faculty members and identified 79 with potentially viable technologies going forward. 3) UIRF, in collaboration with UI College of Medicine, used/is using funds to move a later stage technology forward towards commercialization via a new startup.			

University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	Support operational and personnel costs of key economic development areas	FY 2011 State Appropriations (GIVF)	\$339,638	\$253,878
		FY 2011 Matching Funds (Other)	\$339,638	\$290,038
Description of Project	These funds will support critical economic development support functions associated with University Research Park, BioVentures Center, Technology Innovation Center and IOWA Centers for Enterprise.			
Anticipated End Results	Staff support to provide unique facilities and incubate technology-based companies, as well as facilitate linkage with key university core resources.			
Results achieved to Date/Plans	1) Satellite offices for all IOWA Centers for Enterprise units have been established at BioVentures Centers. This will provide tenant companies direct access to experts to help move their business development goals. 2) Technology Innovation Center occupancy rate is at 77% (11 companies) with two new tenants (Angel eCare and Brain Image Analysis) in FY11. 3) Staff support for UIRP, BVC and TIC. 4) Entrepreneurial education and celebration events that highlight ICE accomplishments as well as recognize University of Iowa faculty, staff and students for entrepreneurial awards. 5) Preferred vendors selected for critical UIRP infrastructure including a fitness facility and a day care facility for park companies. 6) In FY11, The UIRP companies & affiliated labs report 1618 employees living in 161 communities with an average salary of \$63,000.			
University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	Fund expenses at the new BioVentures Building	FY 2011 State Appropriations (GIVF)	\$246,250	\$246,250
		FY 2011 Matching Funds (Other)	\$246,250	\$246,250
Description of Project	The BioVentures Building was made possible by a collaborative partnership between Ryan Companies and the University of Iowa. The new building provides critical space and services for life science startup companies at the University of Iowa Research Park. The BioVentures Center will use these funds to pay debt associated with the construction of the new BioVentures Building.			
Anticipated End Results	Full occupancy of the BioVentures wet lab space and successful graduation of tenant companies to locations within the state of Iowa.			
Results achieved to Date/Plans	1) BioVentures Center Occupancy: 11 of the 20 laboratories (55%) are occupied by tenant companies. 20 of the 26 offices are occupied by tenant companies (77%). We anticipate leasing 2 offices and one laboratory in FY12. There are 73 jobs associated with BVC companies. 2) Created new shared lab space in BVC to support early stage companies in their pursuit of external funding including SBIR .			

University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	To fund the expansion at the Center for BioCatalysis and Bioprocessing.	FY 2011 State Appropriations (GIVEF)	\$126,000	\$126,000
		FY 2011 Matching Funds (Other)	\$126,000	\$126,000
Description of Project	To fund the expansion in Industrial Biotechnology (IB) capability at the Center for BioCatalysis and Bioprocessing. CBB is continuing to collaborate with several start-up companies involved in producing biochemicals and fuels from biomass. Expansion is due to: 1) surge in private and federal/state investments into industrial biotechnology is creating many opportunities; 2) the need for additional equipment and capability to meet all the needs of pilot scale process in industrial biotechnology and, 3) partnership opportunities for CBB with some of the start-up companies.			
Anticipated End Results	CBB is mainly involved in production of bio therapeutic proteins. However, in the last year, CBB has seen a substantial increase in activities related to biofuels and chemicals from biomass. Via this expansion, CBB will be very well positioned to collaborate with Industrial Biotechnology companies and provide "a gateway" for such companies to establish operations in Iowa, including using corn and soybean biomass and/or residues as feed stocks.			
Results achieved to Date/Plans	1) CBB achieved \$2.5 million in revenue in FY11. 2) Several 30 L fermenters and recovery equipment have already been installed as a first step towards establishing full capability in the industrial biotechnology area. 3) In FY11, CBB began technology transfer for production of pyruvic acid. This technology has been licensed to an Iowa company. The company is further scaling up this technology for large scale production.			
University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	Integrate and develop economic development support functions	FY 2011 State Appropriations (GIVEF)	\$148,355	\$148,355
		FY 2011 Matching Funds (Other)	\$148,355	\$148,355
Description of Project	These funds will be used by the Vice President for Research & Economic Development for program integration and development.			
Anticipated End Results	The VPR will lead a coordinated model focused on new business development, as well as linking Iowa based companies with various university assets. The overall goal is to establish a regional asset for individuals and companies interested in entrepreneurship.			
Results achieved to Date/Plans	1) Our collaborative internal economic development organization is leading efforts of the Corridor Business Alliance to create a regional economic development strategy for the Cedar Rapids/Iowa City/Coralville corridor. 2) The UI Research Park continues to grow and currently 3 lots are certified as Shovel Ready and 5 others are nearly ready for development. 3) Early stage planning for partnership between the UIRP, Iowa City Community School District and Kirkwood Community Center for STEM/career academic center within the University of Iowa Research Park.			

University of Iowa	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
	Support training, consultation and outreach for Iowa entrepreneurs	FY 2011 State Appropriations (GIVF)	\$171,310	\$171,310
		FY 2011 Matching Funds (Other)	\$171,310	\$171,310
Description of Project	To fund expenses associated with training, consultation and outreach for Iowa entrepreneurs. John Pappajohn Entrepreneurial Center (JPEC) will continue to expand outreach programs for Iowans.			
Anticipated End Results	The John Pappajohn Entrepreneurial Center, while continuing its strong state-wide focus on educating undergraduates, will increase its commitment to working with faculty/student and staff entrepreneurs who are interested in creating a start-up company, developing business plans, devising marketing strategies and seeking funding opportunities. JPEC will also provide the linkage between Iowa companies and the University expertise.			
Results achieved to Date/Plans	1) Employed a Project Manager to work with UI faculty / staff / students in the areas of strategic business planning, market research, operations and financial assessment. Project manager also identified and managed projects for existing Iowa-based companies to work with UI student consulting teams. 2) JPEC hosted over 24 different opportunities last year for students, faculty and persons from the community. In FY11, over 2,100 attendees came to learn from experienced entrepreneurs on a variety of topics including: Technology Export Roundtable, various tax workshops, and Entrepreneurial Boot Camp. 3) JPEC held various elevator pitch and business plan competitions for UI faculty, staff and students. 308 entrepreneurs participated and 55 received a total of \$80,000 in seed funding.			

University of Iowa - as of December 31, 2011

Grow Iowa Values Fund Appropriations

Board of Regents approved September 2011

- 1 Proof of Concept Funding
- 2 Entrepreneurial Education and Business Support Programs
- 3 Infrastructure Investment for Growing Startup Companies

FY 2012 GIVF

Appropriation

\$576,000

\$230,000

\$135,000

\$211,000

University of Iowa	Project	List of all FY 2012 Revenue Sources	Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
	Proof of Concept Funding	FY 2012 State Appropriations (GIVF)	\$230,000	\$0
		FY 2012 Matching Funds (Other)	\$230,000	\$0
Description of Project	Proof of concept funding will be used to move highly promising, but very early stage, technology from faculty inventors that has commercialization and licensing potential.			
Anticipated End Results	Exciting discoveries from University research are, by definition, very early stage and require sustainable sources of funding to take nascent intellectual property to the point where private investment is viable. The funds are used to support the development of innovations with commercial potential, with the result that more UI technology reaches the marketplace as the foundation for new Iowa companies and/or the growth of existing Iowa companies. The funding is intended to support a wide-range of stages in technology development, from initial concept (prior to intellectual property disclosure), to proof of concept, to licensing and commercialization. GIVF fills this critical void and has enabled UI to take advantage of our growing technology pipeline, nurture companies with desired outcome of create new companies and jobs for the State of Iowa.			
Results achieved to Date/Plans	The request for proposals for the GIVF Seed Grant Program using FY12 funds was announced in September 2011. Through a competitive review process, 18 applications were reviewed with awards going to 7 faculty commercialization ideas being funded. Total funds awarded for this competition was \$250,000.			

University of Iowa	Project	List of all FY 2012 Revenue Sources	Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
	Entrepreneurial Education and Business Support Programs	FY 2012 State Appropriations (GIVF)	\$135,000	\$33,869
		FY 2012 Matching Funds (Other)	\$135,000	\$57,128
Description of Project	To support comprehensive student and faculty entrepreneurial education and business programs to help create and sustain University startup companies.			
Anticipated End Results	The John Pappajohn Entrepreneurial Center (JPEC) offers one of the most comprehensive entrepreneurial education and business support programs in the nation. Featured programs supporting economic development include providing business consulting services to small companies located across Iowa through its student field study program; hosting/sponsoring elevator pitch and business plan competitions to support innovation and new venture creation; supporting the creation and launch of student-based business through the Bedell Entrepreneurship Learning Laboratory; and delivering entrepreneurial education through academic courses across campus and online, workshops/seminars, and high school teacher training/curriculum.			
Results achieved to Date/Plans	1) Employed a Project Manager to work with UI faculty / staff / students in the areas of strategic business planning, market research, operations and financial feasibility. Project manager also identified and managed projects for existing Iowa-based companies to work with UI student consulting teams, administers business plan competitions, and provide strategic business development technical assistance. 2) Expansion of Iowa Medical Innovation Group (IMIG) initiative to complete four commercialization projects. IMIG is a highly successful interdisciplinary program involving students from Medicine, Engineering, Business and Law, who are focused on identifying new opportunities for medical devices and technologies. Twenty-two potential projects were identified and currently four projects are being developed further by a group of thirty-two students. 3) JPEC hosted four innovation competitions with 139 aspiring entrepreneurs presenting their new business opportunities. Additionally, JPEC students provided business consulting services to 21 companies in Iowa.			
University of Iowa	Project	List of all FY 2012 Revenue Sources	Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
	Infrastructure Investment for Growing Startup Companies	FY 2012 State Appropriations (GIVF)	\$211,000	\$47,721
		FY 2012 Matching Funds (Other)	\$211,000	\$56,926
Description of Project	To support incremental infrastructure investment needed to support growing numbers of University startup and technology-based companies, including space and technical assistance.			
Anticipated End Results	The requested funds would continue to invest in technology development infrastructure to strengthen and accelerate commercialization and support critical economic development support functions associated with the UI Research Park, BioVentures Center, Technology Innovation Center and ICE. We will create an innovative, joint venture partnership between the UI, regional economic development leaders and the private sector to expand and develop a new non-laboratory based Incubation Center at the University of Iowa Research Park (UIRP) on the Oakdale Research Campus.			
Results achieved to Date/Plans	1) Request for Qualifications issued to explore developer/partner model for master planning, infrastructure investment, and marketing of the UIRP. 2) Partnership between the UIRP, Iowa City Community School District and Kirkwood Community Center for STEM/career academic center within the UIRP. 3) New position search is currently underway to assist faculty who are considering the creation of a new venture based on their research and innovations. This position will lead a menu of services to faculty as they navigate through early stage business planning and development activities. This includes linking faculty to UI resources, external funding opportunities and identifying industry experts and business mentors. 4) New company recruited to the UIRP and are constructing an 18,000 square ft. building. 5) Partnered with the City of Coralville on a RISE grant to develop critical park infrastructure.			

**YEAR END FULL REPORT: JULY 2011
IOWA STATE UNIVERSITY GIVF PROGRAM**

EXECUTIVE SUMMARY

Commercialization Program

The projects pair ISU faculty with Iowa companies to create or improve products or processes. Each project lasts two years. One year after the completion of the project (or three years after the start), the Iowa companies are surveyed for impact by CIRAS. These funds are a **critical source of gap funding**. They represent a unique resource that can be applied toward the success of Iowa companies. A summary of the projects funded to date is below, followed by the list of active projects. To date, 77 projects have been funded through the Commercialization Program. Forty-one of these projects are complete and many show excellent progress in improving the competitiveness and profitability of the Iowa companies involved. 28 startup companies have been assisted; including **13 new companies that were started in the first five years as a direct result of the GIVF funding**. In total more than 50 Iowa companies have participated in the program.

Surveys are conducted by the Center for Industrial Research and Service (CIRAS) one year after project completion (true impact takes a minimum of 5-10 years).

Project Dates	Survey Year	Companies Surveyed	Jobs Created or Retained	Total Sales Increase	Total Investment & Cost Savings	Average Impact per Company
FY06-FY07	FY08	9*	71	\$9,100,000	\$23,500,000	\$3,600,000
FY07-08	FY09	9	18	\$3,700,000	2,760,000	720,000
FY08-09	FY10	8**	6	600,000	732,000	166,500
FY09 – FY10+	FY11	7**	13	675,000	967,000	234,571
FY10-FY11	FY12	In progress				

* All surveyed companies were start-up companies

** Surveys were not completed for all projects (not everyone chooses to participate in the survey)

+ The sales increase was primarily from 1 successful project, but the jobs impact was spread. Many companies indicated it was too early to tell the sales impact (this is a frequent comment through the years).

Year Project Completed	Number of Projects	Number of Publications & Presentations	Number of Awards	Number of Invention Disclosures	Number of External Funding Applications	Number of Applications Awarded	External Funding Received*
FY12**	11	43	0	2	12	5	\$ 5,565,933
FY11	11	46	1	3	20	6	\$ 940,000
FY10	14	99	8	6	47	13	\$ 2,720,000
FY09	15	53	9	4	48	20	\$ 3,500,000
FY07-08***	n/a	n/a	n/a	n/a	n/a	n/a	n/a

*Some information on award amounts was not included

**These projects are ongoing

***Data was not collected

Infrastructure

- ISU Research Park \$26,000
- Pappajohn Center for Entrepreneurship \$25,000
- VPRED Office \$25,000

FY12 Plans (funding effective until May 31, 2013)

We have not yet implemented any FY 12 projects. With the severe funding cuts, we re-evaluated the most effective use of the funds. The funds are being incorporated into a Proof of Concept Initiative (POCI) that will launch later in January, <http://www.industry.iastate.edu/POCI.html>. The POCI is intended to build on the foundation started by the GIVF program and position Iowa State to more rapidly propel technologies toward market opportunities. We will do this by emphasizing both the business opportunity and the technology in projects that are funded through the POCI. By doing this we will position young companies to be able to attract the next stage of funding from either the state, angel or VC sources and/or position technologies to be more attractive commercialization opportunities for existing companies. The call for applications to the POCI (including GIVF funds) will be announced in late January 2012.

FY11 Projects (to finish May 31, 2012)

Principal Investigator	Project Title	Award Amount
Diane Janvrin	Market Research for Prioritizing Market Segments for Product Development	\$ 40,590
Hui Hu	Development of Advanced Flow Diagnostic Techniques to Characterize Next Generation Fuel Nozzles	\$ 78,305
Patrick Halbur	Development of a Novel Genetic Test for Inherited Bovine Diseases and Its Application to Embryos	\$ 83,000
Rick Sharp	Efficacy of a new Delivery System for B-Hydroxy-B-Methylbutyrate	\$ 99,883
Byron Brehm-Stecher*	Advances in Food Safety: Fast Fragment Analysis for Differentiation and Tracking of Foodborne Pathogens	\$ 106,961
Sri Sritharan	Design Verification and Cost Evaluation of UHPC Towers for Enhancing Iowa's Wind Energy Production	\$ 109,000
Vasant Honavar	Data Mining Tools for Healthcare Informatics	\$ 109,243
Ayman Fayed	Battery Life Enhancement in Portable and Remotely Deployed Systems Using Spread-Spectrum Switching Power Regulators	\$ 117,944
Sanjeevi Sivansankar	Commercialization of an integrated, single molecule Atomic Force Microscope-Fluorescence Microscope for academic and industrial applications	\$ 120,075
Suraj Kothari	A Programmable Software Pattern Analyzer (PSPA); Critical Safety Improvement for Transportation Control Systems	\$ 77,388
Matt Frank	Innovative methods for the manufacturing of patient specific bone implants	\$ 50,000

*No update received this period

FINAL REPORT

Title: Market Research for Prioritizing Market Segments for Product Development and Marketing
PI: Diane Janvrin (Accounting); Sanjeev Agwaral (Marketing)
Company Partners (company names only): WebFilings
Project Goal: Provide WebFilings management with a broad understanding of potential markets for their product and an in-depth analysis of a single market segment.

Publications/presentations based on project:

Included high level findings (sanitized to remove all company identification) in Re-examining the Financial Close Process continuing education presentation for Contemporary Issues in Accounting workshop, December 17, 2010.

Included high level findings (sanitized to remove all company identification) in Janvrin, D., and M. Mascha. Re-examining the Financial Close Process: How You Can Benefit co-authored with M. Mascha, submitted to *Strategic Finance*, May 9, 2011.

Awards received: None to date

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending): None to date

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

WebFilings is an Iowa based startup company that has developed a cloud-based software application to assist publicly traded companies with developing reports for the Securities and Exchange Commission (SEC). We were asked to identify up to twelve industry segments where significant and perpetual reporting requirements exist for regulators, customers or stakeholders. Based on discussions with WebFilings management, we were then directed to conduct an in-depth market analysis of one market segment.

We identified seven industry segments that may be able to use WebFilings' software application and presented our initial (Phase I) results to WebFilings management. After meeting to discuss our results on November 2, 2010, WebFilings management directed us to concentrate on one market segment. During late November and early December, we conducted 17 interviews with chief financial officers for firms in this market segment. The firms we interviewed ranged in revenues from less than \$50 million annual sales to greater than \$200 million annual sales. We analyzed the results of our interviews and submitted the final report on January 22, 2011.

INTERIM REPORT

Title: Development of Advanced Flow Diagnostic Techniques to Characterize Next Generation Fuel Nozzles

PI: Dr. Hui Hu, Aerospace Engineering Dept. Iowa State University

Company Partners (company names only): Goodrich Engine Components Division (GECD)

Project Goal: The goal of this research project is to develop advanced diagnostics to quantify spray characteristics and to elucidate important processes in spray flows, such as the breakup of liquid jets and sheets, atomization and evaporation of fuel droplets, and air/fuel mixing in order to assist GECD in developing next generation fuel nozzles for maximized energy efficiency while minimizing pollutant emissions, and maintaining the operability requirements.

Publications/presentations based on project:

Awards received: \$78,305

Invention disclosures:

External funding applied for (indicate received/denied/pending): We are working with GECD engineers to develop a joint research proposal to NSF-GOALI program soon.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Following progresses have been made on this GIVF project since the proposed project was awarded:

- 1). The system design of the experimental rig needed to carry out the proposed research work has been finished. Some of the hardware parts and test models are being manufactured.
- 2). The theoretical framework of the proposed advanced flow diagnostic techniques has been finished. The high-energy laser system, high-speed imaging system and associated the optics and optic-mechanic devices have already been allocated for this GIVF project.
- 3). A comprehensive literature review of previous research work related to this GIVF research project has already been finished.
- 4). A GECD fuel injector/atomizer nozzle has been already been received for the preliminary measurements.
- 5). A research team has been formed to conduct the proposed research. The team members include: Dr. Hu Hu-the PI; Dr. Zifeng Yang- Post-doctoral Research Associate; and Mr. Daniel Dvorak - a Graduate Research Assistance.
- 6). A comprehensive experimental study has been conducted, and PIV measurements of the spray flows have already been performed.
- 7). The measurement results of the PIV study of the spray flows are being processed and analyzed.
- 8). A conference paper entitled "Laser Based Measurement of a Counter-swirling Airblast Nozzle Spray Flow" has been submitted to 42th AIAA Fluid Dynamics Conference to be held on 25-28 June 2012 at New Orleans, Louisiana.

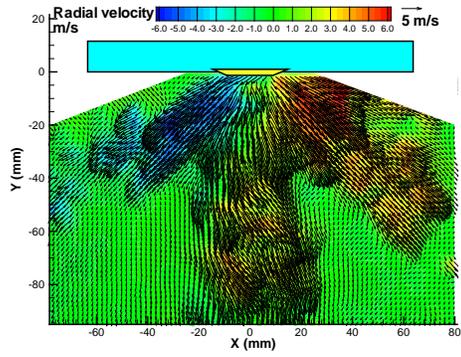


Fig. 1: The test rig.

Fig. 2: A sample of PIV raw image

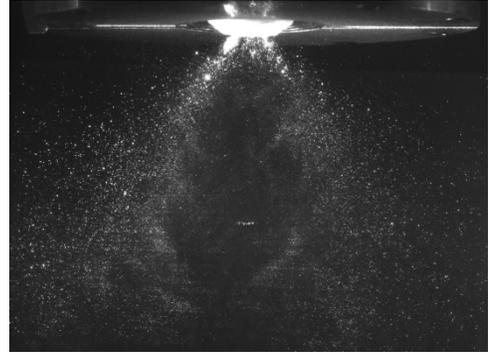


Fig. 3: The derived PIV results

INTERIM REPORT

Title: Development of a novel genetic test for inherited bovine diseases and its application to tissues and embryos

PI: Patrick G. Halbur

Company Partners (company names only): Ames Center for Genetic Technologies (ACGT)

Project Goal: Develop and commercialize a panel of molecular diagnostic assays for detection of genetic diseases and production traits sensitive enough to use on biopsies from bovine embryos. This will benefit the Iowa beef and dairy industries by decreasing costs associated with maintaining the pregnancies of genetically diseased animals and accelerating the selection of genetically superior seed stock Iowa cattle producers.

Publications/presentations based on project: None to date.

Awards received: None to date.

Invention disclosures: None to date.

External funding applied for (indicate received/denied/pending): None to date

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Our original partner on this grant, Ames Center for Genetic Technologies (ACGT) went out of business in mid 2011. We are now working with a small biotech company called Radix BioSolutions. We have continued to advance the use of the Luminex platform for commercial diagnostic testing. Our embryo biopsy technique has been further adapted and validated to achieve acceptable pregnancy rates following post-biopsy testing and freezing. Embryos were flushed from seventy three cows resulting in recovery of 337 embryos of which 200 were biopsied and frozen. Twenty three frozen and biopsied female embryos were transferred into recipients. A 30% pregnancy rate was archived on the first group of 12. Testing for confirmation of pregnancy in the second group of 11 will be done in late January, 2012. Efforts are ongoing to continue to improve pregnancy rates.

In collaboration with Radix Biosolutions we have now successfully adapted the Luminex platform to determine gender of biopsied fetuses. Probe design and test validation for genetic disorders including Complex Vertebral Malformation, Arthrogyrosis Multiplex, Neuropathic Hydrocephalus has not progressed due to problems with acquisition of appropriate positive control materials from other researchers and private companies working in this area. Since the major benefit of the Luminex platform is in high throughput multiplexing diagnostic assays, we have redirected use of the Luminex platform to serological assays. Specifically, we are now focusing on an assay for anti-Mullerian Hormone (AMH) that appears to have good potential to predict the fertility and reproductive longevity of heifers prior to selection as breeding stock. If we are able to further develop and validate this assay it could have substantial economic benefit to the livestock industry. We are now investigating and comparing the use of an experimental AMH ELISA and a novel Luminex-based AMH serological assay to predict fertility (number of viable embryos) in heifers being flushed as a part of this project over the next 6 months.

INTERIM REPORT

Title: Efficacy of a new Delivery System for B-Hydroxy-B-Methylbutyrate

PI: Rick Sharp

Company Partners (company names only): Metabolic Technologies, Inc

Project Goal: There is evidence that intramuscular and intravenous injection of ATP is effective in restoring muscle function after injury and as result of chronic muscle fatigue such as low-back pain. Although oral supplements of ATP are available as non-prescription dietary supplements, there is presently no evidence of their efficacy. Our purpose is to determine if providing an oral dose of ATP (adenosine triphosphate) will influence human muscle strength or endurance.

Publications/presentations based on project: Fuller J.C., R.L. Sharp, H.F. Angus, S. Baier, J.A. Rathmacher. Free acid gel form of β -hydroxy- β -methylbutyrate (HMB) improves HMB clearance from plasma in human subjects compared with the calcium HMB salt. *British Journal of Nutrition.* 7:1-6, 2010.

Awards received:

Invention disclosures:

External funding applied for (indicate received/denied/pending): NIH SBIR grant proposal in preparation.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Since the last interim report (July 2011), we have completed our statistical analysis which revealed some promising results but which did not reach statistical significance. Further analysis showed that adding an additional eight research participants would improve the statistical power and help to increase our confidence in the findings. Consequently, we have requested additional funding from the company to test an additional eight participants. This testing will be conducted during spring and summer 2012. A manuscript is currently in preparation with an additional manuscript expected once the added participant testing is completed.

INTERIM REPORT

Title: *AdvanCEs* in Food Safety: Fast Fragment Analysis for Differentiation and Tracking of Foodborne Pathogens

PI: Byron Brehm-Stecher

Company Partners (company names only): Advanced Analytical Technologies, Inc.

Project Goal: Develop improved DNA fragment-based analyses using an advanced capillary electrophoresis platform; to apply this approach to practical problems of pathogen ecology in layer hen and related agricultural environments of critical importance to Iowan agribusiness.

Publications/presentations based on project:

- Byron Brehm-Stecher spoke at the “Single Cell Analysis Summit”, held 28-29 October, 2010, San Diego, CA
- Byron Brehm-Stecher gave an invited talk at SamplePrep 2011, held April 4-5, 2011, San Diego, CA
- Byron Brehm-Stecher gave an invited talk at the Institute for Food Technologists (IFT) Annual Meeting and Expo’s symposium on “Emerging and Novel Trends in Rapid Diagnostics and Subtyping Methods for Foodborne Pathogens”, June 13, 2011
- Byron Brehm-Stecher gave an invited talk at the NSF Workshop on Novel Sampling and Sensing for Improving Food Safety, Georgia Tech, Atlanta, GA, June 16-17, 2011
- Byron Brehm-Stecher gave an invited talk at Cornell University June 20th on “The Food Safety Curriculum at Iowa State University”; Robert Gravani, President of IFT and other Cornell faculty, as well as our Romanian and Slovenian partners in our Tu-Be-Safe Department of Education ATLANTIS grant and ISU colleagues L. Wilson and A. Mendonca were present.
- Byron Brehm-Stecher gave an invited talk at Select Biosciences’ “Advances In Biodetection & Biosensors” conference in Hamburg, Germany, June 30- July 1, 2011. Met at conference with Steve Lasky, CEO, Advanced Analytical Technologies, Inc. and Lutz Büchner, Director of European Operations, Advanced Analytical Technologies, GmbH. Presentation was helpful in driving interest to Advanced Analytical booth, providing several sales leads.
- **Two abstracts** presented at the American Society for Microbiology 2011 General Meeting (New Orleans, LA):
 - High-Throughput Capillary Electrophoresis for DNA-Based Typing of *Salmonella* spp.
 - Combination of Multiplex PCR and Electrophoretic Detection for Identification of *Salmonella*, with Subspecies Differentiation
- **One abstract** accepted for presentation at the 2011 International Association for Food Protection (IAFP) Annual Meeting (Milwaukee, WI):
 - Application of Multiplex PCR for Rapid Differentiation of *Salmonella* Subspecies I, *S. Typhimurium* and *S. Enteritidis* from Biochemically-Similar Enterobacteriaceae Isolated from Layer Hen Production Facilities

Symposium proposal accepted for development as full 3.5 hour symposium at IAFP 2011: Symposium entitled “From Farm to Fork to Physician: Detection of Human Pathogens Across the Production to Consumption to Disease Continuum”, submitted in collaboration with Dr. Mary Lou Tortorello, Chief, Food Technology Branch, U.S. Food and Drug Administration (FDA). Gary Procop, Chair, Clinical Pathology, Director, Molecular Microbiology, Mycology and Parasitology, Cleveland Clinic Foundation (also a partner from our 2009 GIVF award) will be speaking at this event.

Awards received: Dr. Brehm-Stecher awarded the Early Achievement in Teaching Award, College of Human Sciences, 2011

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending):

Funding Received:

1. **Midwest Poultry Research Program (MPRP, H. Xin, PI). USDA-NIFA \$438,345.** USDA grant for enhancing safety and animal welfare in Midwest Poultry production systems. **My Role:** Co-PI responsible for development of molecular detection and characterization techniques as rapid alternatives to current methods for screening of egg production facilities for the presence of *Salmonella*. Work will be carried out in close coordination with an Iowan partner company, a leading producer of layer hens to the world market.
2. **Assessment of Alternative Production Systems for Laying Hens to Safeguard Animal Welfare and Sustainable Egg Supply (H. Xin, PI).** USDA grant to investigate cage-free layer systems from a holistic perspective (hen behavior and health, environmental impact and food safety). **USDA-NIFA: \$699,906. My**

Role: Co-PI responsible for classical microbiological testing and development of new molecular tests for *Salmonella* spp. in environmental and aerosol samples taken from traditional and alternative layer hen housing.

3. **Tuning and Upgrading the Food Safety Education Curricula for BSc (TU-BE-Safe; L. Wilson, PI).** ATLANTIS grant awarded for harmonizing of EU-US food safety regulations through exchange of ideas between regulators, educators, industry and students and through tuning of Bachelor of Science food safety curricula. EU-US Department of Education: **70,000€ (\$89,000)**. **My Role:** Co-PI serving as member of the U.S. team travelling to Romania and Slovenia to provide scientific expertise on rapid detection of pathogens and on development of educational curricula related to this topic.
4. **Funded Research Visit, Spanish National Research Council.** Antonio Martinez Abad, a Spanish PhD student in the Group of New Materials and Nanotechnology at Instituto de Agroquímica y Tecnología de Alimentos (IATA) in Valencia, Spain, was funded by the Spanish government (**~\$10,000**) to visit my lab April 1 – July 31st, 2011 to study rapid detection and characterization of bacterial pathogens.

Funding Pending:

1. **Midwest Poultry Research Program (MPRP, H. Xin, PI). USDA-NIFA \$438,345.** USDA grant for enhancing safety and animal welfare in Midwest Poultry production systems. **My Role:** Co-PI responsible for development of molecular detection and characterization techniques as rapid alternatives to current methods for screening of egg production facilities for the presence of *Salmonella*. Work will be carried out in close coordination with an Iowan partner company, a leading producer of layer hens to the world market.
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Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress): The project is focused on use of AATI's FS-96 instrument for DNA fragment-based detection and characterization of pathogenic bacteria occurring in layer hen production facilities and other environments of critical importance to Iowan agribusiness. The project is being carried out in close consultation with an Iowan company that is a lead supplier of layer hens to world markets. Additional collaboration in support of this project's technology transfer goals includes partnership with Dr. Hongwei Xin, Director of Iowa State University's Egg Industry Center. In addition to the above list, important milestones for the project include:

- Took delivery of FS-96 instrument, valued at \$70,000.
- Accepted Zongyu Zhang, FSHN PhD student – began work in my lab in May, 2011

This project has served as an essential backdrop for high-visibility collaborative work between the Brehm-Stecher Rapid Microbial Detection and Control Laboratory and Advanced Analytical Technologies, Inc., Specifically:

- We have been invited by the editors of Journal of Visualized Experiments to co-author (with AATI) a video article on application of the FS-96 instrument for DNA-fragment-based analyses of *Salmonella* spp. Experiments for this paper are currently underway.
- AATI personnel presented data from this project during the LabAutomation2011 meeting in late January 2011 in a session on high-throughput methods for the analysis of foods, chaired by Dr. Brehm-Stecher.

- Dr. Brehm-Stecher was invited to speak at the “Advances In Biodetection & Biosensors” conference to be held in Hamburg, Germany (July, 2011). The conference was held within the greater European Lab Automation meeting. Visit was coordinated with Lutz Büchner, Director of European Operations for Advanced Analytical Technologies. Met with Lutz Büchner and Steve Lasky, CEO of Advanced Analytical Technologies, Inc. during this visit. My talk helped drive interest in AATI’s technology, leading to increased traffic to their booth. This visit has enabled us to maximize exposure of our GIVF-funded work with the FS-96 system to potential AATI customers in Europe.

INTERIM REPORT

Title: *Design Verification and Cost Evaluation of UHPC Towers for Enhancing Iowa's Wind Energy Production*

PI: Sri Sritharan

Company Partners (company names only): Iowa Prestressed Concrete, Clipper Windpower, Inc, Lafarge North America

Project Goal: Complete a concrete system suitable for wind turbine power.

Publications/presentations based on project: None to date

Awards received: None to date

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending): None to date

Funding Pending: None to date

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Over the past few months we have been working closely with Clipper, one of our industry partners, to make the tower suitable for commercial use. With new information provided on tower loads and dimension limitations and the request from Clipper to keep the overall cost down with less emphasis on long term performance issues, the tower needed to be redesigned twice. One of the more significant changes that has been made is the transition from Ultra-High Performance Concrete (UHPC) to High Performance Concrete in the tower columns. This dramatically reduces the overall cost of the tower making it much more competitive with other design options available to Clipper. The design still consists of UHPC, but it is used in different components of the tower. In addition, a plan for connecting the tower to the turbine as well as the foundation has been established. A complete computer model of the tower has been developed, and is currently being used to analyze stresses within the tower under extreme and operational loads. After analyzing the results, scaled models will be created in the lab and tested to verify the proposed design.

Due to the financial difficulties, Iowa Prestressed Concrete (IPC) has informed us they will not be able to provide the committed support for the project. This has caused delays in the project. We are now talking another precaster in Omaha, Nebraska. We hope to get the necessary support from them to make the experimental phase of the project completed.

INTERIM REPORT

Title: Data Mining Tools for Healthcare Informatics

PI: Vasant Honavar

Company Partners (company names only): Collaborative Health Solutions, LLC

Project Goal: To demonstrate the feasibility of applying statistically based artificial intelligence algorithms for improving the quality of healthcare.

Publications/presentations based on project:

1. Tu, K., and Honavar, V. (2011). Exemplar-based Robust Coherent Biclustering. In: Proceedings of the SIAM Conference on Data Mining (SDM 2011). SIAM Press, pp. 884-895.
2. Caragea, C., Silvescu, A., Caragea, D. and Honavar, V. (2010). Abstraction-Augmented Markov Models. In: Proceedings of the IEEE Conference on Data Mining (ICDM 2010). IEEE Press. pp. 68-77.
3. Koul, N., Bui, N., and Honavar, V. (2010). Scalable, Updatable Predictive Models for Sequence Data. In Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2010).
4. Koul, N. and Honavar, V. (2010). Learning in the Presence of Ontology Mapping Errors. In: Proceedings of the IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology. pp. 291-296. ACM Press.
5. Pandit, S., and Honavar, V. (2010). Ontology-Guided Extraction of Complex Nested Relationships from Text. IEEE Conference on Tools With Artificial Intelligence (ICTAI 2010). pp. 173-178.
6. Sanghvi, B., Koul, N., and Honavar, V. (2010). Identifying and Eliminating Inconsistencies in Mappings across Hierarchical Ontologies. In: Springer-Verlag Lecture Notes in Computer Science Vol. 6427, pp. 999-1008. Berlin: Springer.

Awards received: None to date

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending): None to date

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

No funds have yet been spent on this project because the start of the project was delayed in part because of delay on the part of Collaborative Health Solutions (CHS) in gathering some of the patient data and making it available to the ISU team working on the project and in part because of the delay in obtaining an account number for the project. The account for the project was set up on June 28, 2011.

The delay on the part of Collaborative Health Solutions, LLC has been mainly due to the challenges of coping with non-standard encodings and nomenclature used in the illness knowledge base as well as the patient health records. Hence, the efforts of CHS have been focused on standardizing the vocabulary used to represent the data in illness knowledge base and patient database. We had anticipated having the first set of data by March 2011. In the mean time, the ISU team focused on developing strategies for data analysis and mining tasks in patient-patient matching, patient-illness matching, and computer-assisted diagnosis and related tasks using illness knowledge base and patient health records. We are well-positioned to take advantage of the illness knowledge base and patient data as soon as they are made available by CHS. While we continue to develop the data analytics tools, we have also begun to explore partnerships with other companies that could provide us with access to other data sets in case CHS does not come through.

Additionally, because some of the data analysis and mining technologies being developed have applications beyond healthcare, we have begun to explore partnerships with companies that focus on other application domains. Based on preliminary discussions, Canrig Drilling Technology has expressed an interest in using our expertise in prediction of events of interest from complex multi-dimensional time series data. This problem shares similarities with some of the data mining problems that arise in a healthcare setting.

INTERIM REPORT

Title: Battery Life Enhancement in Portable and Remotely-Deployed Systems using Spread-Spectrum Switching Power Regulators

PI: Ayman Fayed

Company Partners (company names only): Rockwell Collins Inc.

Project Goal:

The development of energy-efficient buck switching power regulators using innovative random spread-spectrum control schemes to convert their switching output noise into an analog/RF friendly noise spectrum. This will enable using them to directly power sensitive analog/RF modules in battery-operated portable electronic devices, hence eliminating energy inefficient linear regulators and/or expensive noise filtering. This new technology can result in significant reduction in system power consumption, which translates in extended battery life or reduced number of batteries needed by the system in both military and commercial applications.

Publications/presentations based on project:

The following papers have been published so far based on the project:

- [5] Chengwu Tao and Ayman Fayed, "A GSM Power Amplifier Directly-Powered from a DC-DC Power Converter," *IEEE Microwave and Wireless Components Letters*, Dec. 2011.
- [4] Chengwu Tao and Ayman Fayed, "A Buck Converter with Reduced Output Spurs using Asynchronous Frequency Hopping," *IEEE Transactions on Circuits and Systems II*, vol. 58, no. 11, pp. 709-713, Nov. 2011.
- [3] Chengwu Tao, and Ayman Fayed, "Analysis and Modeling of Buck Converters Output Spectrum in CCM with PWM Control," *IEEE Midwest Symp. on Circuits and Systems (MWSCAS)*, Aug. 2011.
- [2] Chengwu Tao, and Ayman Fayed, "Noise Spectrum Manipulation Techniques in Switching Power Converters for Analog and RF Loads," *Government Microcircuit Applications & Critical Technology Conference (GOMACTech)*, Mar. 2011.
- [1] Chengwu Tao, and Ayman Fayed, "Spurious-Noise-Free Buck Regulator for direct-powering of Analog/RF loads using PWM Control with Random Frequency Hopping and Random Phase Chopping," *IEEE International Solid-State Circuits Conference (ISSCC 2011)*, pp. 396-397, Feb. 2011.

The following presentations have been made to companies about the new technology:

- [6] Micrel Inc., on October, 2011.
- [5] Texas Instruments Inc., presenting for the Low Power RF design group, Baltimore, Maryland, June 2011.
- [4] National Semiconductors Inc. on April 4, 2011.
- [3] Texas Instruments Inc. on Nov. 22, 2010.
- [2] Rockwell Collins Inc. on Nov. 18, 2010.
- [1] Skyworks Inc. on Nov. 17, 2010.

Awards received:

Invention disclosures: A provisional invention disclosure has been submitted to the US Patent office "System and Method for Providing Power via a Spurious-Noise-Free Switching Device", Application # 61/444,459 Feb. 2011. A Full disclosure in Jan. 2012

External funding applied for (indicate received/denied/pending):

\$20K in cash and \$20K in-kind support from Rockwell Collins. \$20k cash support has been received. \$19,045 in-kind support has been provided through using lab facilities and test equipment provided by Rockwell Collins.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

In the past 6 months, we have and received and characterized the testchip we designed for achieving the same low-noise performance we previously accomplished but at light-load conditions. Measurement results demonstrated excellent low-noise performance even at very low-load current. This new controller along with our original high-load controller will enable our converter to achieve very low-noise performance with high efficiency across all load current extremes, which makes our proposed design a viable industry-quality product. The new results have been described in a new manuscript that is currently under review. Furthermore, 2 papers on using the proposed technology with RF and Analog types of loads have been published in the past 6 months. The papers have been well received by the industrial and academic communities and the PI has been invited to present the technology to several companies including National, Texas Instruments, Skyworks, and Micrel.

INTERIM REPORT

Title: Commercialization of an integrated, single molecule Atomic Force Microscope-Fluorescence Microscope for academic and industrial applications.

PI: Sanjeevi Sivasankar

Company Partners (company names only): Novascan Technologies

Project Goal: The objective of this proposal is to build a highly integrated and modular single molecule Atomic Force Microscope-Fluorescence Microscope (smAFM-FM) for academic and industrial applications.

Publications/presentations based on project:

Publications

1. Choi, C.L., Li, H., Olson, A.C.K., Jain, P.K., Sivasankar, S.⁺, Alivisatos, A.P.⁺, (2011) Spatially Indirect Emission in a Luminescent Nanocrystal Molecule, *Nano Lett.*, 11, 2358–2362

⁺Corresponding author, [*Impact Factor: 9.6*]

2. Li, H., Yen, C.-F., Sivasankar, S.⁺, (2012) Axial localization of a single fluorophore with sub-nanometer accuracy, (*submitted to Nature Methods*)

⁺Corresponding author

Presentations

1. Li, H., Yen, C.-F., and Sivasankar, S., “Simultaneous AFM force spectroscopy and FRET measurements on single biological molecules”, American Physical Society, March Meeting, 2011
2. Li, H., Yen, C.-F., and Sivasankar, S., “Simultaneous AFM force spectroscopy and FRET measurements on single biological molecules”, Biophysical Society, 55th Annual Meeting, 2011
3. Li, H., and Sivasankar, S., “Simultaneous single molecule AFM and FRET”, Midwest Single Molecule Meeting, 2010

Awards received: None

Invention disclosures

1. Sivasankar, S., and Li, H., (2011) System, apparatus, and method for simultaneous single molecule Atomic Force Microscopy and fluorescence, USPTO 61/574,735.
 2. Li, H., Yen, C.-F., Sivasankar, S.⁺, (2012) Axial localization of a single fluorophore with sub-nanometer accuracy (in preparation)
-

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

Since award of the GIVF funding, we have made significant progress in four areas.

1. We have refined the smAFM-FM instrument by introducing a feedback system that improves measurement accuracy. We have also built and tested an instrument module that permits simultaneous AFM-spectral measurements. We have upgraded to a closed-loop AFM to minimize mechanical drifts.
2. We have performed “proof of concept” simultaneous single molecule AFM-spectral measurements. In these experiments, we used smAFM-FM to measure the force dependent of optical properties of CdS/CdSe tetrapod, a technologically important semiconductor nanocrystal. We were able to demonstrate, for the first time in the world, that a single tetrapod changes its optical properties when subjected to an external force.
3. We have begun working with Novascan Technologies to integrate their VERTIGO AFM platform on the single molecule fluorescence microscope. When this integration is complete, we will acquire data that will be used for generating sales and marketing material to commercialize the instrument
4. We have recently invented a novel technology, **Single Molecule Probe-scanning Standing-wave Optical Nanometry (SiMPSON)** for axial localization of a single fluorophore with sub-nanometer accuracy. In a conventional fluorescence microscope, resolution along the z-axis is limited to approximately 500 nm. SiMPSON is an easy to implement technique developed using GIVF funding that can be used to obtain sub-nanometer resolution. We have used SiMPSON to measure the orientation of DNA of different lengths, grafted on surfaces with different functionalities which is important for DNA microarrays and gene sequencing experiments. We have submitted a manuscript based on this work to *Nature Methods* (the top journal in this field) and are preparing an invention disclosure for ISURF.

INTERIM REPORT

Title: A Programmable Software Pattern Analyzer (PSPA); Critical Safety Improvement for Transportation Control Systems

PI: Suraj Kothari

Company Partners (company names only): EnSoft

Project Goal: The project is aimed at developing the Programmable Software Pattern Analyzer (PSPA). The PSPA will be useful to discover underlying programming patterns and use those to validate mission-critical software. Specific applications are targeted at two areas of software: (a) the safety-critical control system software such as the flight control software, (b) operating systems at all levels from small systems for smart devices to large systems for cloud computing. The PSPA will offer the programming capability to perform thousands of program analysis instances in few seconds as opposed to several hours it currently takes to do a single instance.

Publications/presentations based on project:

1. Kothari Suraj, and Jeremias Saucedo, "How tracking Byzantine bugs in the Linux kernel led to a new way of thinking about complex software," Embedded World Conference, Germany, March, 2011.

Invited Talks:

1. "Efficient and unified approach to validating large C programs," at Cisco, Cisco Campus, California, September 10, 2010
2. "Efficient and unified approach to validating large C programs," at VMware, California, November 5, 2010.
3. "Intelligence amplifying tools for software," at Principal Financial, Des Moines, March 8, 2011.
4. "Intelligence amplifying tools for software," at Tata Automotive Software Development Center, Pune, India, June 6, 2011.
5. "A 2-Phase Validation Method Based on a New Approach to Program Comprehension," at Tata Research Development and Design Centre (TRDDC), Pune, India, June 15, 2011

Awards received: None to date

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending):

We received a grant from DARPA for \$4,137,198. The research we did on the GIVF project has played an important role in securing this grant. The goal of this project is to develop a programmable analyzer for Java and apply it to analyze the Android smart phone apps to detect presence of malware. Dr. Kothari the sole Principal Investigator on this grant.

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

A query-based programming environment for analyzing software patterns has been developed. To demonstrate the powerful software analysis capability being developed through this project, we did a case study to validate six versions of the Linux kernel for its safety properties. This is the first validation study of this kind that takes into account various complexities including multi-threading and interrupt processing. We have developed a graph-theoretic modeling capability which combined with the programmable analysis capability has enabled a complete validation of highly complex software. This type of validation, as cited in our original proposal, was considered intractable so far. This research is currently being documented through three journal papers. It also helped us in securing a four million dollar grant from DARPA.

INTERIM REPORT

Title: Innovative methods for the manufacturing of patient specific bone implants

PI: Matt Frank

Company Partners (company names only):

Project Goal: To develop methods for bone implant manufacturing, provide pilot testing results, and move toward commercialization of a software product for surgery planning and rapid implant production.

Publications/presentations based on project: Paper submitted on a method for harvest planning of bone implants: “A Method to Represent Heterogeneous Materials for Rapid Prototyping –The Matryoshka Model”, Shuangyan Lei, Matthew C. Frank, PhD, Department of Industrial and Manufacturing Systems Engineering, Iowa State University; Donald D. Anderson, PhD and Thomas D. Brown, PhD, The University of Iowa; Submitted to the Rapid Prototyping Journal

Awards received: The J.R. Neff Award, for the best proposal submitted to the Musculoskeletal Foundation in 2011 (out of ~85 applications)

Invention disclosures: None to date

External funding applied for (indicate received/denied/pending): Full Proposal submitted: “Automated Shape-Manufactured Allograft Bone Implants to Fit Anatomic Irregularities”, Funding source: The Musculoskeletal Research Foundation, Amount: \$224,000, Status: RECEIVED at the level of \$290,445, to begin in February 2012

Progress report (300 word maximum, please focus on results in non-technical terms and commercialization progress):

This project officially ended in the summer of 2011; however, the above mentioned paper, award, and funding is directly attributed to the GIVF program. In addition to the items above, we have two notable accomplishments in moving toward commercialization.

First, we have created “beta” testing site at the University of Iowa. As a logical transition toward testing the ability to send files remotely to a tissue bank in order to machine implants, we decided to undertake beta testing of these procedures in the Orthopaedic Biomechanics Laboratory at the University of Iowa. Because of its staffing by a group of well-experienced general orthopaedic biomechanical engineers, and because it was within practical driving distance if technical support visits were needed from ISU, we reasoned the UI lab would offer a reasonable chance for success as a beta-testing site. Another attraction was that a toolroom-scale 3-axis Haas CNC milling machine was already in routine use in the UI laboratory’s machine shop. Finally, several faculty orthopaedic surgeons are active in biomechanics research at UI, making it conducive for them to have input in the development/testing process. As matters worked out, the beta testing progressed very quickly and smoothly: We were able to successfully implement the ISU-developed process for shape-machining of bone implants in less than one month (Figure). For the bone sample in the figure, the actual machining code was simply emailed from ISU to UI. We feel this is an example of how the technology could be used in a real setting; CT scans would be sent to the implant planning center, and then codes sent to the tissue bank; finally, the machined implant is sent to the hospital in time for surgery.



Figure – First machined bone sample at the University of Iowa Beta testing facility; files sent via email from ISU to control the bone machining

Second, we continued to move forward in forming a company. As of June 2011, FxRedux Solutions, LLC was filed with the State of Iowa and the IRS. Dr. Matt Frank will serve as a co-owner, along with 5 collaborators at the University of Iowa. As of January 1st, 2012, an Operating agreement is in place for the FxRedux Solutions LLC company.

Iowa State University - as of December 31, 2011
 Grow Iowa Values Fund Appropriations

FY 2011 GIVF Appropriation

\$1,459,200 Board of Regents approved August

- 1 Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture \$500,000
- 2 Commercialization Program \$959,200

Iowa State University	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
1	Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture	FY 2011 State Appropriations (GIVF)	\$500,000	\$382,246
		FY 2011 Matching Funds (General Fund)	\$335,741	
		FY 2011 Matching Funds (In-Kind)	\$200,000	
		FY 2011 Matching Funds (Other)	\$0	
Description of Project	See individual projects			
Anticipated End Results				
Results achieved to Date				
Plans				
Iowa State University	Project	List of all FY 2011 Revenue Sources	Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
2	Commercialization Program	FY 2011 State Appropriations (GIVF)	\$959,200	\$421,482
		FY 2011 Matching Funds (General Fund)	\$532,331	
		FY 2011 Matching Funds (Federal Support)		
		FY 2011 Matching Funds (Cash)		
		FY 2011 Matching Funds (In-Kind)	\$134,011	
Description of Project	See individual projects			
Anticipated End Results				
Results achieved to Date				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator			\$200,000	\$82,246
Description of Project	Pappajohn Center for Entrepreneurship			
Anticipated End Results				
Results achieved to Date	Grow Iowa Values Funds provide student and staff support to assist individuals starting and growing businesses. The funds also support on campus entrepreneurship activities to provide students educational and experiential opportunities in entrepreneurship, including participation in a national student entrepreneurship conference, and supporting coordinating experienced entrepreneurs as student mentors.			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator			\$200,000	\$200,000
Description of Project	ISU Research Park			
Anticipated End Results				
Results achieved to Date	Grow Iowa Values Funds support efforts to provide support and assistance to companies at the Research Park or prospective Research Park companies. The companies assisted include; 1. Working with technology startup companies and faculty and students considering forming new companies. 2. Assisting technology companies secure the resources they need to be successful and grow. 3. Working with state and local economic development officials to recruit existing technology companies to Iowa.			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator			\$100,000	\$100,000
Description of Project	Vice President for Research			
Anticipated End Results				
Results achieved to Date	Grow Iowa Values Funds support the technology transfer and economic development mission of the Office of the Vice President for Research and Economic Development (VPRED). Specifically, these funds are used to support the Industry Relations effort including salary support and operating budget. The Grow Iowa Values Fund commercialization program is administered in the VPRED office as well as efforts to coordinate industry relations and other tech transfer activities across campus.			
Plans				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Diane Janvrin	\$40,590	\$36,521	\$11,736
Description of Project	Market Research for Prioritizing Market Segments for Product Development			
Anticipated End Results	Provide WebFilings management with a broad understanding of potential markets for their product and an in-depth analysis of a single market segment.			
Results achieved to Date	<p>WebFilings is an Iowa based startup company that has developed a cloud-based software application to assist publicly traded companies with developing reports for the Securities and Exchange Commission (SEC). We were asked to identify up to twelve industry segments where significant and perpetual reporting requirements exist for regulators, customers or stakeholders. Based on discussions with WebFilings management, we were then directed to conduct an in-depth market analysis of one market segment.</p> <p>We identified seven industry segments that may be able to use WebFilings' software application and presented our initial (Phase I) results to WebFilings management. After meeting to discuss our results on November 2, 2010, WebFilings management directed us to concentrate on one market segment. During late November and early December, we conducted 17 interviews with chief financial officers for firms in this market segment. The firms we interviewed ranged in revenues from less than \$50 million annual sales to greater than \$200 million annual sales. We analyzed the results of our interviews and submitted the final report on January 22, 2011.</p>			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Hui Hu	\$78,305	\$78,305	\$18,911
Description of Project	Development of Advanced Flow Diagnostic Techniques to Characterize Next Generation Fuel Nozzles			
Anticipated End Results	The goal of this research project is to develop advanced diagnostics to quantify spray characteristics and to elucidate important processes in spray flows, such as the breakup of liquid jets and sheets, atomization and evaporation of fuel droplets, and air/fuel mixing in order to assist GECD in developing next generation fuel nozzles for maximized energy efficiency while minimizing pollutant emissions, and maintaining the operability requirements.			
Results achieved to Date	<p>Following progresses have been made on this GIVF project since the proposed project was awarded:</p> <ol style="list-style-type: none"> 1). The system design of the experimental rig needed to carry out the proposed research work has been finished. Some of the hardware parts and test models are being manufactured. 2). The theoretical framework of the proposed advanced flow diagnostic techniques has been finished. The high-energy laser system, high-speed imaging system and associated the optics and optic-mechanic devices have already been allocated for this GIVF project. 3). A comprehensive literature review of previous research work related to this GIVF research project has already been finished. 4). A GECD fuel injector/atomizer nozzle has been already been received for the preliminary measurements. 5). A research team has been formed to conduct the proposed research. The team members include: Dr. Hu Hu-the PI; Dr. Zifeng Yang- Post-doctoral Research Associate; and Mr. Daniel Dvorak - a Graduate Research Assistance. 6). A comprehensive experimental study has been conducted, and PIV measurements of the spray flows have already been performed. 7). The measurement results of the PIV study of the spray flows are being processed and analyzed. 8). A conference paper entitled "Laser Based Measurement of a Counter-swirling Airblast Nozzle Spray Flow" has been submitted to 42th AIAA Fluid Dynamics Conference to be held on 25-28 June 2012 at New Orleans, Louisiana. 			
Plans				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Patrick Halbur	\$83,000	\$83,000	\$46,715
Description of Project	Development of a Novel Genetic Test for Inherited Bovine Disease and Its Application to Embryos			
Anticipated End Results	Develop and commercialize a panel of molecular diagnostic assays for detection of genetic diseases and production traits sensitive enough to use on biopsies from bovine embryos. This will benefit the Iowa beef and dairy industries by decreasing costs associated with maintaining the pregnancies of genetically diseased animals and accelerating the selection of genetically superior seed stock Iowa cattle producers.			
Results achieved to Date	<p>Our original partner on this grant, Ames Center for Genetic Technologies (ACGT) went out of business in mid 2011. We are now working with a small biotech company called Radix BioSolutions. We have continued to advance the use of the Luminex platform for commercial diagnostic testing. Our embryo biopsy technique has been further adapted and validated to achieve acceptable pregnancy rates following post-biopsy testing and freezing. Embryos were flushed from seventy three cows resulting in recovery of 337 embryos of which 200 were biopsied and frozen. Twenty three frozen and biopsied female embryos were transferred into recipients. A 30% pregnancy rate was archived on the first group of 12. Testing for confirmation of pregnancy in the second group of 11 will be done in late January, 2012. Efforts are ongoing to continue to improve pregnancy rates.</p> <p>In collaboration with Radix Biosolutions we have now successfully adapted the Luminex platform to determine gender of biopsied fetuses. Probe design and test validation for genetic disorders including Complex Vertebral Malformation, Arthrogryposis Multiplex, Neuropathic Hydrocephalus has not progressed due to problems with acquisition of appropriate positive control materials from other researchers and private companies working in this area. Since the major benefit of the Luminex platform is in high throughput multiplexing diagnostic assays, we have redirected use of the Luminex platform to serological assays. Specifically, we are now focusing on an assay for anti-Mullerian Hormone (AMH) that appears to have good potential to predict the fertility and reproductive longevity of heifers prior to selection as breeding stock. If we are able to further develop and validate this assay it could have substantial economic benefit to the livestock industry. We are now investigating and comparing the use of an experimental AMH ELISA and a novel Luminex-based AMH serological assay to predict fertility (number of viable embryos) in heifers being flushed as a part of this project over the next 6 months.</p>			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Rick Sharp	\$99,883	\$75,314	\$38,826
Description of Project	Efficacy of a new delivery system for B-Hydroxy-B-Methylbutyrate			
Anticipated End Results				
Results achieved to Date	Since the last interim report (July 2011), we have completed our statistical analysis which revealed some promising results but which did not reach statistical significance. Further analysis showed			
Plans				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Byron Brehm-Stecher (no update received)	\$106,961	\$91,046	\$53,752
Description of Project	Advances in food safety: fast fragment analysis for differentiation and tracking of foodborne pathogens			
Anticipated End Results	Develop improved DNA fragment-based analyses using an advanced capillary electrophoresis platform; to apply this approach to practical problems of pathogen ecology in layer hen and related agricultural environments of critical importance to Iowan agribusiness.			
Results achieved to Date	<p>The project is focused on use of AATI's FS-96 instrument for DNA fragment-based detection and characterization of pathogenic bacteria occurring in layer hen production facilities and other environments of critical importance to Iowan agribusiness. The project is being carried out in close consultation with an Iowan company that is a lead supplier of layer hens to world markets. Additional collaboration in support of this project's technology transfer goals includes partnership with Dr. Hongwei Xin, Director of Iowa State University's Egg Industry Center. In addition to the above list, important milestones for the project include:</p> <ul style="list-style-type: none"> • Took delivery of FS-96 instrument, valued at \$70,000. • Accepted Zongyu Zhang, FSHN PhD student – began work in my lab in May, 2011 <p>This project has served as an essential backdrop for high-visibility collaborative work between the Brehm-Stecher Rapid Microbial Detection and Control Laboratory and Advanced Analytical Technologies, Inc., Specifically:</p> <ul style="list-style-type: none"> • We have been invited by the editors of Journal of Visualized Experiments to co-author (with AATI) a video article on application of the FS-96 instrument for DNA-fragment-based analyses of Salmonella spp. Experiments for this paper are currently underway. • AATI personnel presented data from this project during the LabAutomation2011 meeting in late January 2011 in a session on high-throughput methods for the analysis of foods, chaired by Dr. Brehm-Stecher. • Dr. Brehm-Stecher was invited to speak at the "Advances In Biodetection & Biosensors" conference to be held in Hamburg, Germany (July, 2011). The conference was held within the greater European Lab Automation meeting. Visit was coordinated with Lutz Büchner, Director of European Operations for Advanced Analytical Technologies. Met with Lutz Büchner and Steve Lasky, CEO of Advanced Analytical Technologies, Inc. during this visit. My talk helped drive interest in AATI's technology, leading to increased traffic to their booth. This visit has enabled us to maximize exposure of our GIVF-funded work with the FS-96 system to potential AATI customers in Europe. 			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Sri Sritharan	\$109,000	\$106,784	\$28,471
Description of Project	Design Verification and cost evaluation of UHPC towers for enhancing Iowa's wind energy production			
Anticipated End Results				
Results achieved to Date	<p>Over the past few months we have been working closely with Clipper, one of our industry partners, to make the tower suitable for commercial use. With new information provided on tower loads and dimension limitations and the request from Clipper to keep the overall cost down with less emphasis on long term performance issues, the tower needed to be redesigned twice. One of the more significant changes that has been made is the transition from Ultra-High Performance Concrete (UHPC) to High Performance Concrete in the tower columns. This dramatically reduces the overall cost of the tower making it much more competitive with other design options available to Clipper. The design still consists of UHPC, but it is used in different components of the tower. In addition, a plan for connecting the tower to the turbine as well as the foundation has been established. A complete computer model of the tower has been developed, and is currently being used to analyze stresses within the tower under extreme and operational loads. After analyzing the results, scaled models will be created in the lab and tested to verify the proposed design.</p> <p>Due to the financial difficulties, Iowa Prestressed Concrete (IPC) has informed us they will not be able to provide the committed support for the project. This has caused delays in the project. We are now talking another precaster in Omaha, Nebraska. We hope to get the necessary support from them to make the experimental phase of the project completed.</p>			
Plans				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Vasant Honavar (no update received)	\$109,243	\$109,243	\$22,934
Description of Project	Data mining tools for healthcare informatics			
Anticipated End Results	To demonstrate the feasibility of applying statistically based artificial intelligence algorithms for improving the quality of healthcare.			
Results achieved to Date	<p>No funds have yet been spent on this project because the start of the project was delayed in part because of delay on the part of Collaborative Health Solutions (CHS) in gathering some of the patient data and making it available to the ISU team working on the project and in part because of the delay in obtaining an account number for the project. The account for the project was set up on June 28, 2011.</p> <p>The delay on the part of Collaborative Health Solutions, LLC has been mainly due to the challenges of coping with non-standard encodings and nomenclature used in the illness knowledge base as well as the patient health records. Hence, the efforts of CHS have been focused on standardizing the vocabulary used to represent the data in illness knowledge base and patient database. We had anticipated having the first set of data by March 2011. In the mean time, the ISU team focused on developing strategies for data analysis and mining tasks in patient-patient matching, patient-illness matching, and computer-assisted diagnosis and related tasks using illness knowledge base and patient health records. We are well-positioned to take advantage of the illness knowledge base and patient data as soon as they are made available by CHS. While we continue to develop the data analytics tools, we have also begun to explore partnerships with other companies that could provide us with access to other data sets in case CHS does not come through.</p> <p>Additionally, because some of the data analysis and mining technologies being developed have applications beyond healthcare, we have begun to explore partnerships with companies that focus on other application domains. Based on preliminary discussions, Canrig Drilling Technology has expressed an interest in using our expertise in prediction of events of interest from complex multi-dimensional time series data. This problem shares similarities with some of the data mining problems that arise in a healthcare setting.</p>			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Ayman Fayed	\$117,944	\$99,665	\$95,282
Description of Project	Battery life enhancement in portable and remotely deployed systems using spread-spectrum switching power regulators			
Anticipated End Results	The development of energy-efficient buck switching power regulators using innovative random spread-spectrum control schemes to convert their switching output noise into an analog/RF friendly noise spectrum. This will enable using them to directly power sensitive analog/RF modules in battery-operated portable electronic devices, hence eliminating energy inefficient linear regulators and/or expensive noise filtering. This new technology can result in significant reduction in system power consumption, which translates in extended battery life or reduced number of batteries needed by the system in both military and commercial applications.			
Results achieved to Date	In the past 6 months, we have and received and characterized the testchip we designed for achieving the same low-noise performance we previously accomplished but at light-load conditions. Measurement results demonstrated excellent low-noise performance even at very low-load current. This new controller along with our original high-load controller will enable our converter to achieve very low-noise performance with high efficiency across all load current extremes, which makes our proposed design a viable industry-quality product. The new results have been described in a new manuscript that is currently under review. Furthermore, 2 papers on using the proposed technology with RF and Analog types of loads have been published in the past 6 months. The papers have been well received by the industrial and academic communities and the PI has been invited to present the technology to several companies including National, Texas Instruments, Skyworks, and Micrel.			
Plans				

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Sanjeevi Sivansankar	\$120,075	\$107,433	\$38,181
Description of Project	Commercialization of an integrated single molecule atomic force microscope-fluorescence microscope for academic and industrial applications			
Anticipated End Results	The objective of this proposal is to build a highly integrated and modular single molecule Atomic Force Microscope-Fluorescence Microscope (smAFM-FM) for academic and industrial applications.			
Results achieved to Date	<p>Since award of the GIVF funding, we have made significant progress in four areas.</p> <ol style="list-style-type: none"> 1. We have refined the smAFM-FM instrument by introducing a feedback system that improves measurement accuracy. We have also built and tested an instrument module that permits simultaneous AFM-spectral measurements . We have upgraded to a closed-loop AFM to minimize mechanical drifts. 2. We have performed "proof of concept" simultaneous single molecule AFM-spectral measurements. In these experiments, we used smAFM-FM to measure the force dependent of optical properties of CdS/CdSe tetrapod, a technologically important semiconductor nanocrystal. We were able to demonstrate, for the first time in the world, that a single tetrapod changes its optical properties when subjected to an external force. 3. We have begun working with Novascan Technologies to integrate their VERTIGO AFM platform on the single molecule fluorescence microscope. When this integration is complete, we will acquire data that will be used for generating sales and marketing material to commercialize the instrument 4. We have recently invented a novel technology, Single Molecule Probe-scanning Standing-wave Optical Nanometry (SiMPSON) for axial localization of a single fluorophore with sub-nanometer accuracy. In a conventional fluorescence microscope, resolution along the z-axis is limited to approximately 500 nm. SiMPSON is an easy to implement technique developed using GIVF funding that can be used to obtain sub-nanometer resolution. We have used SiMPSON to measure the orientation of DNA of different lengths, grafted on surfaces with different functionalities which is important for DNA microarrays and gene sequencing experiments. We have submitted a manuscript based on this work to Nature Methods (the top journal in this field) and are preparing an invention disclosure for ISURF. 			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Arun Somani / Suraj Kothari (no update received)	\$77,388	\$76,268	\$21,892
Description of Project	A programmable software pattern analyzer (PSPA); Critical safety improvement for transportation control systems			
Anticipated End Results	The project is aimed at developing the Programmable Software Pattern Analyzer (PSPA). The PSPA will be useful to discover underlying programming patterns and use those to validate mission-critical software. Specific applications are targeted at two areas of software: (a) the safety-critical control system software such as the flight control software, (b) operating systems at all levels from small systems for smart devices to large systems for cloud computing. The PSPA will offer the programming capability to perform thousands of program analysis instances in few seconds as opposed to several hours it currently takes to do a single instance.			
Results achieved to Date	A query-based programming environment for analyzing software patterns has been developed. To demonstrate the powerful software analysis capability being developed through this project, we did a case study to validate six versions of the Linux kernel for its safety properties. This is the first validation study of this kind that takes into account various complexities including multi-threading and interrupt processing. We have developed a graph-theoretic modeling capability which combined with the programmable analysis capability has enabled a complete validation of highly complex software. This type of validation, as cited in our original proposal, was considered intractable so far. This research is currently being documented through three journal papers. It also helped us in securing a four million dollar grant from DARPA.			

Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Matt Frank	\$50,000	\$22,626	\$22,626
Description of Project	Innovative methods for the manufacturing of patient specific bone implants			
Anticipated End Results	To develop methods for bone implant manufacturing, provide pilot testing results, and move toward commercialization of a software product for surgery planning and rapid implant production.			
Results achieved to Date	<p>This project officially ended in the summer of 2011; however, the above mentioned paper, award, and funding is directly attributed to the GIVF program. In addition to the items above, we have two notable accomplishments in moving toward commercialization. Second, we continued to move forward in forming a company. As of June 2011, FxRedux Solutions, LLC was filed with the State of Iowa and the IRS. Dr. Matt Frank will serve as a co-owner, along with 5 collaborators at the University of Iowa. As of January 1st, 2012, an Operating agreement is in place for the FxRedux Solutions LLC company.</p> <p>First, we have created "beta" testing site at the University of Iowa. As a logical transition toward testing the ability to send files remotely to a tissue bank in order to machine implants, we decided to undertake beta testing of these procedures in the Orthopaedic Biomechanics Laboratory at the University of Iowa. Because of its staffing by a group of well-experienced general orthopaedic biomechanical engineers, and because it was within practical driving distance if technical support visits were needed from ISU, we reasoned the UI lab would offer a reasonable chance for success as a beta-testing site. Another attraction was that a toolroom-scale 3-axis Haas CNC milling machine was already in routine use in the UI laboratory's machine shop. Finally, several faculty orthopaedic surgeons are active in biomechanics research at UI, making it conducive for them to have input in the development/testing process. As matters worked out, the beta testing progressed very quickly and smoothly: We were able to successfully implement the ISU-developed process for shape-machining of bone implants in less than one month (Figure). For the bone sample in the figure, the actual machining code was simply emailed from ISU to UI. We feel this is an example of how the technology could be used in a real setting; CT scans would be sent to the implant planning center, and then codes sent to the tissue bank; finally, the machined implant is sent to the hospital in time for surgery.</p>			
Plans				
Iowa State University	Project	Total Project Budget	Allocated Dollars FY 2011	Amount of FY 2011 Allocation Expended as of 12/31/2011
Principal Investigator	Peter Keeling (new project)	\$73,000	\$73,000	\$22,155
Description of Project	Furanics based biorenewable Chemical			
Anticipated End Results	Development of a method for the selective dehydration of glucose and starch to produce furan derivatives such as 5-hydroxymethylfurfural (HMF).			
Results achieved to Date	<p>The proposed project will enable studies of scale-up batch-reactor issues and polysaccharide feedstock evaluation. The results will lead to a detailed business development plan and set-the-stage for second year studies of the techno-commercial potential. These are summarized in the following milestone statements and supporting milestones chart.</p> <ol style="list-style-type: none"> 1. Comparison of glucose and starch versus fructose catalysis with solvent extraction per Dumesic methods. 2. Kinetics understood and optimized for the conversion of glucose to HMF in a batch reactor system. 3. Kinetics understood and optimized for the conversion of glucose to HMF in a flow reactor system. 4. Build the business development plan. 5. Demonstration of a solid acid catalyst for the conversion of monosaccharides and oligosaccharides to HMF. 6. Evaluation of techno-commercial potential by estimating costs of production in optimized system. 7. Build the business case for a \$10m investment in a pilot plant. 			

FY 2012 GIVF Appropriation

\$576,000 Board of Regents approved September 2011

- | | | |
|---|--|-----------|
| 1 | Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture | \$76,000 |
| 2 | Commercialization Program | \$500,000 |

Iowa State University	Project	List of all FY 2012 Revenue Sources	Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
1	Commercialization Infrastructure and Campus-Wide Entrepreneurial Culture	FY 2012 State Appropriations (GIVF)	\$76,000	\$14,373
		FY 2012 Matching Funds (General Fund)	\$6,899	
		FY 2012 Matching Funds (In-Kind)		
		FY 2012 Matching Funds (Other)		
		Description of Project		
Infrastructure funds for programming in the ISU Research Park (\$26K), Pappajohn Center (\$25K and Industry Relations function (\$25K) in the VPRED office.				
Anticipated End Results				
Results achieved to Date				
Plans				
Iowa State University	Project	List of all FY 2012 Revenue Sources	Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
2	Commercialization Program	FY 2012 State Appropriations (GIVF)	\$500,000	\$0
		FY 2012 Matching Funds (General Fund)		
		FY 2012 Matching Funds (Federal Support)		
		FY 2012 Matching Funds (Cash)		
		FY 2012 Matching Funds (In-Kind)		
Description of Project				
Anticipated End Results				
Results achieved to Date				
We have not yet implemented any FY 12 projects. With the severe funding cuts, we re-evaluated the most effective use of the funds. The funds are being incorporated into a Proof of Concept Initiative (POCI) that will launch later in January, http://www.industry.iastate.edu/POCI.html . The POCI is intended to build on the foundation started by the GIVF program and position Iowa State to more rapidly propel technologies toward market opportunities. We will do this by emphasizing both the business opportunity and the technology in projects that are funded through the POCI. By doing this we will position young companies to be able to attract the next stage of funding from either the state, angel or VC sources and/or position technologies to be more attractive commercialization opportunities for existing companies. The call for applications to the POCI (including GIVF funds) will be announced in late January 2012.				

University of Northern Iowa - as of December 31, 2011
 Grow Iowa Values Fund Appropriations

	<u>FY 2011 GIVF Appropriation - \$729,600</u>		
1	Technology Transfer and Business Incubation (5603)		\$254,600
2	Rural Entrepreneurship (5605)		\$150,000
3	Market Research (5607)		\$75,000
4	Capacity Building and Implementation for Regional Development (5604)		\$100,000
5	National Ag-Based Lubricants (NABL) Center (5606)	\$150,000	\$729,600.00

Reflects 15% reduction from previous year allocation

	<u>FY 2012 GIVF Appropriation - \$238,000</u>		
1	Technology Transfer and Business Incubation (5603)		\$93,000
2	Rural Entrepreneurship (5605)		\$95,000
4	Capacity Building and Implementation for Regional Development (5604)		\$50,000
5	National Ag-Based Lubricants (NABL) Center (5606)	\$50,000	\$288,000.00

Reflects 60.5% reduction from previous year allocation

University of Northern Iowa	Project	List of all FY 2011 & 2012 Revenue Sources	5603 Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011	List of all FY 2012 Revenue Sources	5757 Revenue Dollars for FY 2012	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
1	Technology Transfer and Business Incubation	FY 2011 State Appropriations (GIVF)	\$254,600	\$254,600	FY 2012 State Appropriations (GIVF)	\$93,000	\$22,036
		FY 2011 Federal Support			FY 2012 Federal Funding		
		FY 2011 Other		\$288,022	FY 2012 Other		\$101,313
Description of Project	UNI continues to advance intellectual property disclosures, protection and commercialization across campus. Strategies for commercialization include licensing, strategic partnerships and new business development. The Innovation Incubator has created a hub facility, coalescing the existing strength of Intellectual Property disclosures and University research with quality business services to support business incubation and growth. The incubator and support facilities offer a physical link between the Iowa business community, campus innovators and faculty researchers to enhance technology transfer at UNI. Central to this approach are multiple BCS programs that combine education and innovation - some new and some successfully established - working in tandem to create a rich spectrum of services and a unique physical environment to support technology transfer and entrepreneurship.						
Anticipated End Results	Even with substantially fewer resources, UNI remains committed to the tech transfer process. We expect eight disclosures, two patent applications and two license agreements. UNI's incubator will remain full and graduate 4-5 businesses into the regional economy and launch 15 student businesses in the JPEC student Business Incubator. Five late stage faculty research projects will also be assisted.						
Results Achieved to Date	During the first half of FY 2012, four disclosures were received with two moving toward commercialization. UNI has begun active collaboration with the ISU Research Foundation, receiving due diligence technical assistance. Five faculty research projects are being assisted and two have filed disclosures. The Innovation Incubator is full and two companies have recently graduated into the regional economy.						
Plans	UNI will continue to focus on commercialization initiatives, including license negotiations and business start ups. At least eight intellectual property disclosures will be received with two licensing agreements executed under patent or trade-secret provisions and UNI will continue to support late-stage faculty research projects. In addition, the Student Business Incubator will remain full, generating spin-off companies for the Iowa economy. UNI will also expand its corporate research and development program to assist existing businesses in Iowa.						

University of Northern Iowa	Project	List of all FY 2011 & 2012 Revenue Sources	5605 Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011	List of all FY 2012 Revenue Sources	5759 Revenue Dollars for FY 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
2	Rural Entrepreneurship	FY 2011 State Appropriations (GIVF) FY 2011 Federal Support FY 2011 Other	\$150,000	\$150,000	FY 2011 State Appropriations (GIVF) FY 2011 Federal Funding FY 2011 Other	\$95,000	\$24,705 \$2,914
Description of Project	MyEntreNet is an entrepreneurship development system which identifies, recruits, networks and serves small business owners with information, services and access to capital in rural regions across the state. Through a comprehensive, technology-supported approach of building community capacity, customized technical assistance, networking and enhanced access to capital, MyEntreNet fills a significant gap in rural economic development in Iowa.						
Anticipated End Results	In FY 2012, MyEntre.Net's online community will grow to 12,000 small business owners engaged online. The 5th annual EntreFest! conference will attract 200 attendees, 1,000 participants will attend a live or YouTube-hosted MyEntre.Net webinar, 300 individuals will be served by the Business Concierge with research or direct referrals, and multiple, online Dream Big Grow Here contests will be held in FY 2012.						
Results Achieved to Date	<p>In the first six months of the year, membership at MyEntre.Net, Iowa's online community for entrepreneurs and small business owners, has grown to 10,899- within 1,111 members of the entire year goal of 12,000. Four hundred twenty five participants attended one of 25 new, interactive Webinars during the fall of 2011 at www.myentre.net. In addition, 70 of the best webinars on MyEntre.Net were uploaded to YouTube in October 2011 where they have collectively been viewed 752 times in eight weeks. The MyEntre.Net Business Concierge has served 214 individual small businesses with highly customized business intelligence, including competition analysis, GIS mapping, industry trends information, customer demographics or short- run customized mailing lists since July 1st. Six regional Dream Big Grow Here contests were hosted in August and September of 2011, attracting nearly 100,000 visitors to the contest site, where they voted, posted comments and shared ideas online. The regional contest winners will participate in a statewide Pitch-Off March 8th, 2012 during the EntreFest! contest in Ames for a grand prize of \$10,000. A total of 12 regional and statewide sponsors now provide marketing assistance and contest winnings for Iowa's Dream Big Grow Here contests.</p> <p>Connections is the newest feature on MyEntre.Net; Iowa's first comprehensive and searchable database of people, programs and capital to serve entrepreneurs. Compiled in partnership with the Iowa Innovation Council, Connections features more than 2,700 searchable listings of grants, loans, technical assistance, research assistance and other services supporting innovators in the state of Iowa. MyEntre.Net is working with the Entrepreneurial Roundtable to develop a marketing and referral campaign for Connections this spring.</p> <p>Work is underway to conduct the UNI statewide small business survey during January 2012. This in-depth survey assists policy makers, legislators, economic developers and service providers to understand who is doing business in the state, what services and resources they need, and to quantify the economic impact of small business in the state of Iowa. The 2012 survey will sample both the MyEntre.Net community and the broader small business community throughout the state. A white paper is planned for March 2012.</p>						
Plans	In FY12, MyEntre.Net membership will continue to be expanded by marketing recently developed services and resources statewide, including the new Business Concierge research team, as well as Connections, an interactive database of 2,700 sources of capital, research, incubation and technical assistance in Iowa. Online membership at www.myentre.net is expected to reach 12,000. EntreFest!, Iowa's statewide traveling conference for small businesses and entrepreneurs, will celebrate its fifth year in 2012. UNI will continue to lead a consortium of service providers to host the event in the spring of 2012, anticipating 200 attendees. Based upon the demand expressed by MyEntre.Net users, UNI will continue to host bi-monthly educational webinars, recruit other partners to host webinars through MyEntre.Net and market archived webinars through YouTube. Pending sponsor support for contest winnings, the successful Dream Big, Grow Here contests will continue into 2012 with additional regional contests and a statewide "pitch-off" among winners.						

University of Northern Iowa	Project	List of all FY 2011 & 2012 Revenue Sources	5604 Revenue Dollars for FY 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2011	List of all FY 2011 Revenue Sources	5758 Revenue Dollars for FY 2012	Amount of FY 2011 State Appropriations Expended as of 12/31/2011
3	Capacity Building and Implementation for Regional Development/Helping Regions Succeed	FY 2011 State Appropriations (GIVF) FY 2011 Federal Support FY 2011 Other	\$100,000	\$100,000	FY 2011 State Appropriations (GIVF) FY 2011 Federal Funding FY 2011 Other	\$50,000	\$23,496 \$22,983 \$32,788
Description of Project	With the shared purpose of expanding and stimulating economic growth across the state of Iowa, the Institute for Decision Making (IDM) continues to implement regional development assistance programs that build capacity regionally and locally, sustaining Iowa's regional economies over the long term. A major initiative for FY 2013 will be leading an effort with Professional Developers of Iowa (PDI) to move regionalism to the next level and will be referred to as Regionalism 2.0.						
Anticipated End Results	Leading the Regionalism 2.0 initiative with focus on four key areas: 1) mapping the assets within a region, 2) engaging regional leadership, 3) developing a model for regional revenue sharing and 4) creating a specialization model to enhance effectiveness among regional development partnerships. IDM will also continue to guide and serve regional development groups with their economic development challenges and opportunities.						
Results Achieved to Date	IDM has helped organize Regionalism 2.0 and conducted multiple planning meetings with PDI and steering committee members. In addition, IDM continued to serve four regions in the areas of organizational management, issue resolution and planning. IDM worked with IWD to prepare and release, on a regional basis, a practical guide for local leadership who may potentially be, or are actually, dealing with mass layoffs or business closures. IDM partnered with utility companies and economic development service providers to update the Synchronist existing industry survey and helped local development organizations conduct more effective existing industry programs. An entrepreneurial communities project was designed to integrate entrepreneurship into the regional economy. IDM participated in a statewide LOIS task group to address and analyze data fields to determine minimal requirements for the regions.						
Plans	IDM will lead the Regionalism 2.0 initiative to help restructure and reenergize regions across the state. IDM will continue supporting regional targeting, marketing, organizational management and planning efforts as requested. IDM will assist in the development and assessment of region-specific benchmarks. IDM will participate in the Business Expansion & Strategic Trends (BEST) of Iowa program and expand the Entrepreneurial Communities Project to enhance and increase entrepreneurship initiatives in local economic development. IDM will pilot a certificate program in economic development within a region to provide a practical learning experience for elected official and volunteers in the basic concepts, information, methods and strategies of local economic development.						

University of Northern Iowa	Project	List of all FY 2011 & 2012 Revenue Sources	5606 Revenue Dollars for 2011	Amount of FY 2011 State Appropriations Expended as of 12/31/2010	List of all FY 2011 Revenue Sources	5760 Revenue Dollars for 2012	Amount of FY 2012 State Appropriations Expended as of 12/31/2011
4	National Ag-Based Lubricants (NABL) Center	FY 2011 State Appropriations (GIVF) FY 2011 Federal Support FY 2011 Other	\$150,000	\$150,000 \$150,792	FY 2011 State Appropriations (GIVF) FY 2011 Federal Funding FY 2011 Other	\$50,000	\$0* \$50,000
Description of Project	As a globally-recognized biobased lubricants research center, The National Ag-Based Lubricants (NABL) Center supports the growth of Iowa's bioeconomy with cutting-edge research involving biobased industrial and automotive lubricants, greases, functional fluids, and biobased product process and manufacturing technologies. NABL has become the primary source of expertise for biobased lubricants and greases in Iowa and the nation, a role that is increasingly important during this critical transition from a petroleum-based economy to a growing biobased economy.						
Anticipated End Results	As the anchor for Cedar Valley TechWorks, a regional economic development initiative focused on the bioeconomy, NABL's resources and expertise will be used to attract prospective biobased companies to Iowa. NABL will continue to provide support for the profitability and growth of the state's biobased products industry by offering credible performance testing resources and successful new product development.						
Results Achieved to Date	<p>The NABL Center provides ongoing leadership in Iowa's BioEconomy. During the first half of FY 2012, NABL achieved the following:</p> <ul style="list-style-type: none"> • Reached 50% completion of research for the US Department of Navy, investigating appropriate applications and relevant specification limits for use of biolubricants in Navy equipment. • Continued to expand testing services to the bioproducts industry, both within the State of Iowa and internationally. • Achieved success in research activities with AMTek Inc., a locally-owned company in Cedar Rapids, Iowa and a leader in microwave technology and industrial microwave systems, to develop a microwave-based process for biobased lubricating grease and other bioproducts. Results include a novel process for producing biobased grease using microwave heating. The microwave kettle concept is being leveraged by AMTek to advance the State's food processing industry, with decreased energy requirements. • Filed for US and International patents on a novel process for producing biobased grease using microwave heating. • NABL's expertise in biolubricant development makes the Center a leader in identifying value-added uses for biorefinery products: NABL provided continued services in product development and sample evaluation to four companies, each investigating the opportunity to develop biolubricants from unique products of their proprietary biorefining processes. 						
Plans	<p>The NABL Center will continue to collaborate with industry partners on development of full-scale microwave-based biolubricant manufacturing processes and equipment. This equipment has also been shown to have value in the State's food processing industry, and may impart a cost advantage for this industry, in addition to energy efficiency and product quality benefits. Partnerships will be sought in the biorefining and chemical industries, as well, to investigate applications of this equipment.</p> <p>New research work investigating the isolation of specific fatty acids as lubricant feedstocks, coupled with new derivatives of soybean and other oilseeds, will continue, and shows potential for expanded value-added activities in Iowa's biobased product manufacturing industry. Renewed focus on core NABL Center capabilities in tribological and performance-based research areas will push for full realization of the benefits inherent in lubricant formulations utilizing isolated fatty acid components to specifically influence final lubricant properties.</p>						

*NABL is finalizing a grant extension with the US Department of Energy. Grow Iowa Values Funds will be used as a match when the grant is approved. All GIVF funds will be expended by the end of the fiscal year.